VEGETATION OF THE GIPPSLAND LAKES CATCHMENT

by

P. K. Gullan, N. G. Walsh and S. J. Forbes*

ABSTRACT

The catchment of the Gippsland Lakes, Victoria, was surveyed between November 1977 and December 1978, using a floristics-based, quadrat-sampling technique. The data from 722 quadrat sites were analysed via a computer-based, numerical sorting and classification procedure to determine the major, floristic vegetation types of the areas. These types were then arranged, hierarchically, into 13 floristic *communities* each of which contained one or more distinct, floristic *sub-communities*.

The communities defined in this paper range from alpine heathlands and woodlands in the north of the study area, through montane and lowland forests in central districts to coastal heathlands and woodlands in the south-east.

CONTENTS

INTRODUCTION

This paper presents the results of a vegetation survey of the Gippsland Lakes catchment. Its purpose is to define and describe the major floristic types in the vegetation of the study area and to give an indication of the geographic and environmental ranges of each.

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Fig. 1. Location of the study area. Stippling represents the Lakes Catchment.

THE STUDY AREA

The Gippsland lakes catchment is the combined catchment area of five major river systems which run into the coastal lakes of East Gippsland, Victoria (Figs. 1 and 2). These river systems are (from west to east) the Latrobe (major tributaries are the Thomson and Macalister Rivers), Avon, Mitchell (major tributaries are the Wonnangatta, Wongungarra and Dargo Rivers) Nicholson and Tambo (major tributary is the Timbarra River) Rivers. The catchment is approximately 22,000 km² in area and ranges in altitude from above 1500 m, in the Victorian Alps, to sea level. About 65% of the catchment is covered by native vegetation, most of which is crown land controlled by the Victorian Forests Commission, the Crown Lands Department or the National Parks Authority. The country devoid of native vegetation is predominantly privately owned and utilized for agriculture (mainly grazing) although extensive areas of crown land north and south of Sale support plantations of *Pinus radiata*. The largest area of unvegetated country lies immediately north and west of the lakes and extends to the foothills of the Great Dividing Range below 200 m (Fig. 2). This area is associated with the major townships and extends north and south of the Princes Highway between Warragul and Bairnsdale and east and west of the Omeo Highway between Bairnsdale and Omeo.

THE SURVEY

Method

Field Work

The entire study area was divided into rectangles of dimensions 5 minutes latitude and 5 minutes longitude (Fig. 3). Within each rectangle substantially covered by native vegetation four sample sites were chosen (occasionally more in the varied vegetation near the coast and occasionally less in rectangles that were poorly vegetated) so that they differed as much as possible in gross habitat features (ridgetop, river, swamp, hillside etc.). At each site 20 mammal traps were laid (this survey was a combined zoological-botanical project) in an irregular line and floristic information was collected along this line and approximately 5 m to each side. The traplines varied in length but were commonly about 100 m long so that a vegetation sample usually covered an area of approximately 1,000 m². Within this area every vascular plant species was identified and assigned a cover-abundance value (Braun-Blanquet, 1928) corresponding to a visual estimate of its performance in the area.

In all, 722 sites (Fig. 4) were sampled from 179 rectangles between October 1977 and December 1978 (11 field trips each of 12 days duration). Approximately 25 rectangles eligible for sampling were not investigated, primarily because of their inaccessability at the time of survey.

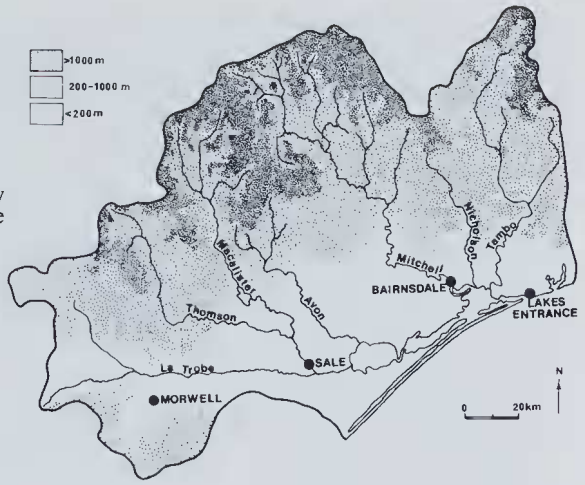

Fig. 2. The study area. Different density stippling represents different altitude ranges.

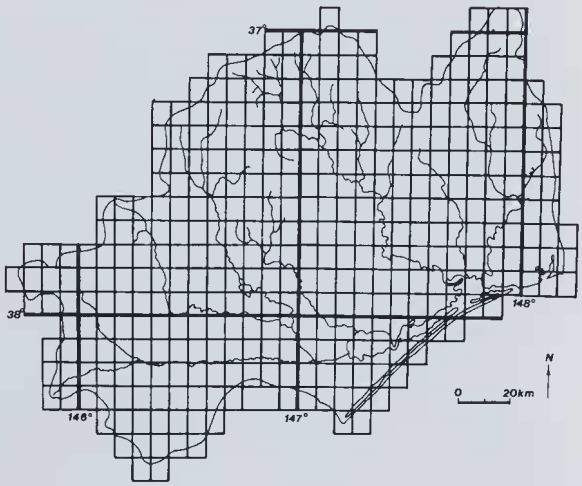

Fig. 3. The 5′ latitude × 5′ longitude grid system superimposed on a map of the study area.

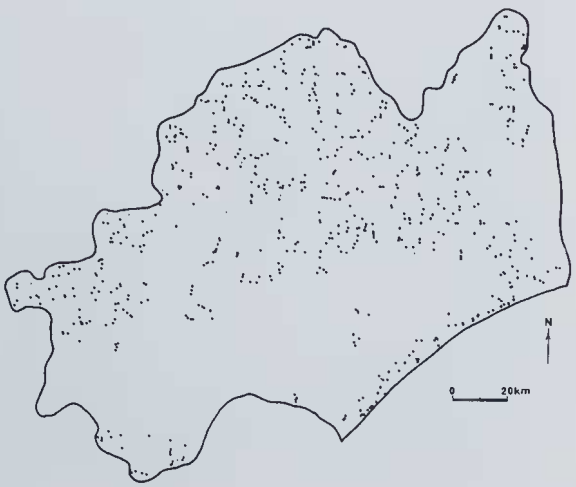

Fig. 4. Distribution of sample sites within the study area. The blank areas to the south-west and in the north-east are mostly agricultural land and *Pinus radiata* plantations.

Plant Identification

All plants which could not be identified in the field were collected, labelled and taken to the National Herbarium for closer examination and comparison with the Herbarium's reference collection. This allowed the identification, to species level, of all but a few plants collected. Nevertheless a number of qualifications must be made concerning the nomenclature used in this paper. As far as possible all nomenclature follows that of Willis (1970, 1973) with amendments by Todd (1979). However, due to the difficulty in distinguishing between certain closely related groups of species, particularly those for which vegetative parts only could be found, some names should be taken to mean one of two or more species. For example:

Eucalyptus rubida, *E. dalrympleana*—no distinction has been made between these closely related species. All have been recorded as *E. rubida*.

Geranium potentilloides, *G. solanderi*, *G. retrorsum*—distinctions between these species is difficult in the absence of flowering and fruting material. Wrong names may have been applied in these circumstances.

Hydrocotyle hirta, *H. laxiflora*, *H. algida*—as above.

Gnaphalium spicatum, Gamochaeta purpurea—as above

Poa australis spp. agg.—no attempt was made to distinguish between the 17 species of this group described by Vickery (1970).

Rubus fruticosis spp. agg.—no attempt was made to distinguish between the 8 species of this group described by Amor and Miles (1974).

Luzula campestris spp. agg.—no attempt was made to distinguish between the species of this group described by Nördenskiold (1969) and Edgar (1975).

Plantago varia—no attempt was made to distinguish between members of this group assigned to other species by Briggs, Carolin and Pulley (1973).

Juncus spp. (section Genuini)—species within this group may have been misidentified. The taxonomy of this section is in considerable confusion and current revisionary work is still incomplete.

Data Storage and Analysis

Floristic information from each site has been permanently stored on magnetic disk along with its locality (latitude-longitude), altitude (metres above sea level) and date of collection. Analyses were in the form of a computer-based, numerical classification procedure, coupled with a hand-sorting procedure of the type outlined in Gullan (1978). The final result of this type of analysis is a two-way table which contains all of the raw data in a sorted form. However, the two-way tables presented in this paper contain only a portion of the total number of species found in the survey. This is because most species occur in 10% or less of the sites and add little to the overall vegetation description.

The tables themselves are laid out in the following way. Numbers opposite 'QUADRATS' are labels for site localities. Each vertical column of figures represents a list of the species found in one site and each horizontal row represents all the sites in which one species has been found. The plus signs and numbers within the body of the tables indicate the cover abundance for each species at each site (See caption to Table 1).

The sample sites are not listed in numerical order, nor are the species names in alphabetical order, and this is so because the table has been sorted (by the above procedure) in two ways:

1. All sample sites which share a large number of species have been placed close together.
2. All species which are often found together in the field are placed together on the table.

Groups of sample sites have been defined and are delineated by vertical lines on the tables. These site-groups represent the vegetation communities and their sub-communities. Each of these will be examined in detail later in this paper. Horizontal lines on the table delineate groups of species which characterise each sub-community or community.

Terminology

The terms sub-community, community and character species have specific definitions in the context of this paper. The first two of these have been chosen to label vegetation types because they have not often been used in vegetation work before and consequently do not carry with them the confusion and controversy associated with terms such as formation, association and alliance.

Sub-community

A sub-community is a group of quadrats which have a similar floristic composition. It is synonymous with the term 'nodum' of Poore (1955) and is the basic unit of vegetation used in this paper.

Community

A community is a collection of sub-communities (or sometimes a single sub-community) which have floristic and environmental affinities. The community may represent a floristic continuum along which arbitrary divisions have been made to form sub-communities. It may also represent a collection of sub-communities which are considered to be different temporal phases of the same vegetation. Or it may represent a collection of sub-communities which are considered to be a single vegetation type under different disturbance regimes.

Character Species

A character species is one which occurs frequently and consistently within a sub-community and is consequently useful as part of the sub-community description. It is not necessarily confined to the particular sub-community. In this study, the minimum frequency of occurrence necessary for any species to be accepted as a character species has been determined in the following way:

Where F = minimum allowable frequency of a character species, and
Q = number of quadrats in the sub-community or community
Then if $Q \leq 10$, $F = 55$
if $Q \geq 50$, $F = 35$
if $Q > 10$ or < 50, $F = 55 - (Q - 10)/2$

Thus, if a community or sub-community contains 50 quadrats or more, a character species must occur in at least 35% of these. If a community or sub-community contains 10 quadrats or less then a character species must occur in at least 55% of these. Minimum frequency values for communities or sub-communities containing between 10 and 50 quadrats are calculated (by the above method) as lying somewhere between 55% and 35%.

The choice of the two frequency limits was arbitrary although based on the logic that as the number of sites representing a community or sub-community increases the necessary frequency of occurrence for useful indicator species decreases.

Community Names

Community names have been designed in this paper to take the form of "common names". These common names do not follow any set rules such as those of Specht (1970) or Braun-Blanquet (1928) because they are not intended to form the basis for a formal nomenclature. Their purpose is identical to that of common names used for animals and plants. That is, to provide a familiar and descriptive name which takes into account common, although often imprecise, terminology.

Each name usually comprises a structural part (heath, woodland, forest etc.), an environmental part (dry, wet, riparian, alpine, coastal etc.) and a floristic or life-form part (sclerophyllous, *Banksia*, Snow Gum etc.). However, some, such as Dry Sclerophyll and Wet Sclerophyll Forest, are "old-fashioned" names which have already become well-used common names, and others, such as Damp Sclerophyll Forest, are invented names which are designed to relate to the established terms.

The naming system devised here is not necessarily recommended as a standard to be followed by others. However, it is the experience of the authors that names of this type are those most frequently used in verbal discussions and descriptions of vegetation. They are offered here as a further means of conveying to the reader something about the vegetation being described.

Limitations and qualifications

Plant Identification

Each quadrat site was visited once only with the consequence that most plant species had to be identified without flowering or fruiting material. This problem was particularly acute during autumn and winter.

With experienced field botanists many species can be identified with confidence from vegetative material. However, there are always problems with monocotyledons and herbaceous dicotyledons (see previous remarks on Plant Identification). A more significant and basically insoluble problem is the absence of any visible signs of many annual species at certain times of the year (particularly autumn and winter). A few of these have been identified from dried remains present at the time of survey but many orchids, *Wahlenbergia* spp., lilies, sundews etc. will have been missed if the survey time did not coincide with the flowering period of the plant.

Distribution of Floristic Vegetation Types

The average distance between quadrats was between 4 and 5 kilometres. It is considered that this sampling intensity was great enough to determine all the major floristic vegetation types of the area and to give a good representation of their geographical ranges. However, the distribution maps provided in the RESULTS of this paper should not be interpreted as vegetation maps. They simply represent the distribution of each community or sub-community over all the sites sampled. If two adjacent quadrats share the same vegetation sub-community it *should not* be assumed that all the land between those sites also supports that sub-community.

Weed Problem

An index of introduced (since European settlement) plant species has been calculated for each quadrat site to give some indication of weed invasion into the native plant communities (see the sub-community summary sheets). It should not be assumed that this information is in any way indicative of weed problems or weed distribution in the study area as a whole. The purpose of this study is to examine the native plant areas and sites badly infested with weeds were purposely avoided. Therefore, while the list of native plants in this paper might be considered as a good representation of the native flora of the study area the list of weed species will be a gross underestimate. Similarly, many of the weeds that have been recorded in quadrats will be far more widely spread than this paper indicates.

RESULTS

For easy access of any piece of information relevant to the aims of this paper, the results of the survey and its analyses have been prepared in a number of ways.

Two-way Tables

The first of the data presentations is a series of two-way tables (Tables 1-7). These are the most important information sources for describing floristic variation

across the study area. They contain almost all of the raw data (only those species with occurrences in less than about 5% of the quadrat sites are absent) arranged in such a way as to represent:

a. The quadrats which make up each community and sub-community.
b. The species which characterise them.
c. The relationships and differences between communities and sub-communities.
d. The variation within communities and sub-communities.
e. The distribution of species not often characteristic of communities or sub-communities but which occur sporadically throughout the study area.
f. The cover-abundance of each species in each quadrat.

In short, the two-way tables contain the most complete and succinct description of the floristic composition of the vegetation.

It is worth noting that the two-way tables presented in this paper contain information from a much larger area and from sites much further apart than in most previous studies which use two-way tables (e.g. Bridgewater 1975, Gullan et al. 1976, Gullan 1978). As a consequence the tables are more heterogeneous than many others in the literature.

Community Descriptions

Thirteen communities have been described and named in the Gippsland Lakes catchment (GLC). These are representative of the major, extant vegetation types of the area. Other communities, now heavily disturbed or virtually absent, were obviously more important and widespread in the past. However, data from the present survey do not describe them adequately (due to the relatively low-intensity sampling) and no descriptions of them appear in this paper.

Of the 722 quadrats from this survey 48 have not been dealt with in this paper because they did not fit in to the vegetation classification. These quadrats contain vegetation which is grossly disturbed, representative of communities which are no longer widespread (e.g. Open-Forests containing *Eucalyptus tereticornis*) or fragments of vegetation types better developed elsewhere (e.g. western remnants of East Gippsland rainforests).

The following is a brief description of each of the major communities:

GLC Community 1: Alpine Wet Heathlands (2 sub-communities; 32 sites).
Closed heath to low woodlands of plains and damp depressions in the high country from the Nunniong Plateau to the Snowy Range.

GLC Community 2: Snow Gum Woodlands (2 sub-communities; 33 sites).
Low woodland of the well-drained ridges of the high country from the Nunniong Plateau to the Snowy Range but concentrated in the Mt. Hotham Area.

GLC Community 3: Montane Forest (3 sub-communities; 117 sites).
High altitude open and tall open-forest. The predominant vegetation of the high country from the Nunniong Plateau through to the Baw Baw Plateau. It is found primarily on the more sheltered hillsides away from exposed ridges.

GLC Community 4: Montane Riparian Forest (2 sub-communities; 41 sites).
High-altitude, riparian, tall open-forest occurring in the upper reaches of rivers from the Tambo to the Macalister. It is closely associated, both floristically and geographically, with the Wet Sclerophyll Forest of community 5.

GLC Community 5: Wet Sclerophyll Forest (1 sub-community; 73 sites).
Tall open-forest usually dominated by *Eucalyptus regnans*, but otherwise dominated by a mixture of *E. obliqua*, *E. cypellocarpa*, *E. viminalis*, *E. radiata* or *E. dives*. This forest occupies two distinct parts of the study area. The

largest and best developed forests (mostly *E. regnans* forests) are west and south of the Snowy Range. The other area (where *E. regnans* is uncommon), south of Omeo, is less extensive and confined to the upper reaches of the Nicholson and Tambo Rivers.

GLC Community 6: Damp Sclerophyll Forest (6 sub-communities; 118 sites).
Open-forest community distributed throughout the intermediate altitudes of the study area in a broad band from Powelltown to Buchan. This community is floristically quite variable both compositionally and diversally. This is indicative of its wide geographical range and heavy forestry usage, accompanied by intense and varied fuel reduction procedures.

GLC Community 7: Montane, Sclerophyllous Woodland (1 sub-community; 28 sites).
A woodland community distributed on exposed ridges to the north-east and south-west of the Snowy Range. The understory is dominated by sclerophyllous, small-leafed, heathland-type plants.

GLC Community 8: Dry Sclerophyll Forest (2 sub-communities; 76 sites).
Open-forest scattered on dry foothills surrounding tributaries of the Tambo, Nicholson, Mitchell, Avon, Macalister and Latrobe Rivers.

GLC Community 9: Riparian Forest (4 sub-communities; 57 sites).
A floristically rich, riparian, open-forest scattered through dry foothill country surrounding tributaries of the Avon, Mitchell, Nicholson and Tambo Rivers.

GLC Community 10: *Leptospermum myrsinoides* Heathland (1 sub-community; 25 sites).
Low open-woodland and closed heath inland from the Gippsland lakes and the Coastal Banksia Woodlands. This community is distributed mainly south and west from Sperm Whale Head on podzols developed from siliceous sands.

GLC Community 11: Lowland, Sclerophyllous Forest (2 sub-communities; 28 sites).
Open forest distributed in the lowlands north of Lakes Entrance.

GLC Community 12: Coastal Banksia Woodland (1 sub-community; 43 sites).
Low open-woodland distributed along the leeward side of the Ninety Mile Beach, all around the Gippsland Lakes, immediately adjacent to the water. The soil supporting this community is made up largely of calcareous sands.

GLC Community 13: Primary Dune Scrub (1 sub-community; 3 sites).
Primary dune community of low shrubs, forbs and grasses extending from Seaspray to Lakes Entrance.

Sub-community Summary Sheets

The following three sets of information have been incorporated into a single-page layout for each sub-community. This combination of information constitutes the primary means of describing vegetation in this paper.

Sub-community Distribution Maps: For each sub-community, the distribution of all its constitutent sites (large black dots) has been superimposed on a map containing the Lakes, major river systems and basic topographic information.

Sub-community Tables: In these tables information from the two-way tables has been summarised and presented in a simplified format. The names of the species which are characteristic of a sub-community are listed along with their frequency of occurrence and the average cover-abundance (C/A) of each species when it occurs. The order of the species in these tables is in accordance with their frequency in the sub-community. This order is at variance with the two-way tables which arrange

species so that sub-community and community interrelationships are best demonstrated. Consequently, although it is easier to assess individual sub-communities from the sub-community tables it is less easy to compare one sub-community with another.

Sub-community Descriptions and Annotations: A simple verbal description has been made for each of the sub-communities which includes briefly summarised information on their distribution, environment and conservation significance. Included with these descriptions are details of altitude, vegetation structure, floristic richness and weed composition.

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Table 1. Two-way table of Communities 1 and 2.

Cover-abundance symbols:
+ <5% cover, uncommon
1 Up to 5% cover, common
2 5-20% cover
3 10-50% cover
4 50-75% cover
5 75-100% cover

COMMUNITY	1		2	
SUB-COMMUNITY	1	2	1	2
QUADRATS / SPECIES	000000000 11333311 000000000 00614225 81584741	000000000000000000000000000 33233333322333323333333 000000000000000000000000000 01663211167142344561503 49565126776309436901597	000000000000000000000000000 22332222222222222222211134 000000000000000000000000000 44000001111241442222177224 16123890125126453458308817	000000000 22221111 000000000 46643222 78898053
Comesperma retusum	1+1++	+ +		
Oreobolus distichus	1++ 1	+ 1 +		
Baumea gunnii	11+1	++ +		
Sphagnum spp.	2 2 2 5+	3		
Restio australis	2 2 2+	2 11 1 2+		
Epacris breviflora	+++221	41 1112+ + +		
Hakea microcarpa	211221	122 2 1111 + 1	21	12 1
Epacris microphylla	31 21 +	2 22 1 12 21 +3 2	1 1	
Gonocarpus micranthus	1 1111	+ 11 + + + + + 1 +1	+1 +	+
Epacris paludosa	2+232322	2222212113+23 3 12+	+	
Baeckea gunniana	23133322	3122321 1 13311 1 2 21	2	1
Empodisma minus	33334332	21+13+12 1+332 +3+2		
Callistemon sieberi	2 1 23 2	222 12 1 12212+3+1 2	1 2	
Bossiaea foliosa	+ +	312+1 1 22+2 22 21	1 2 1 2	1 11
Eucalyptus stellulata	+1+ 1	13221 1222 1 3	12	+ 21
Oxylobium ellipticum	+	2 2111 1 3112 1	2	
Gnaphalium japonicum		111++ ++ +1	1 +	+
Leptospermum grandifolium	1	2 2 22 2 +++ 4	+	23
Deyeuxia quadriseta	+	1 1 + + 1+ ++ 1+++1 1	+1 1 1 1 + 1	++ +
Carex breviculmis	+	++ ++ + 1+ ++1+ 1	+ 1 1 1 + + 1	+1
Leptorhynchos squamatus	11	1++ + +++1+ ++ 1	1 + 1 1 1 1 1	1
Blechnum pennamarina	1 1	+ +111112++ 11 2	+ 1 1	2121
Carex appressa	1 1 2	2231222121 11 +4	1 2 1 1 2 2 1	5221
Gonocarpus tetragynus		++ ++1+++ + +11+++ ++	+ 1+ 1 ++1 1	+ +++

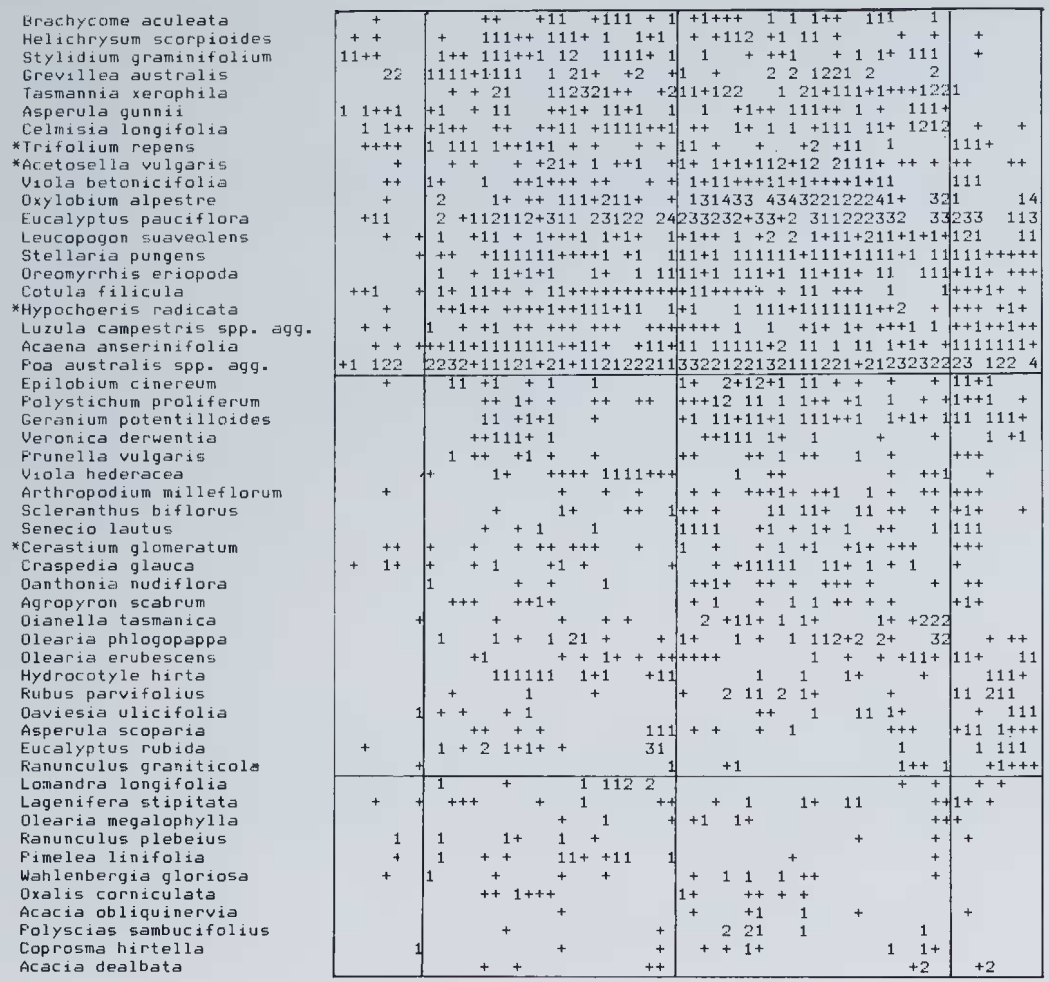
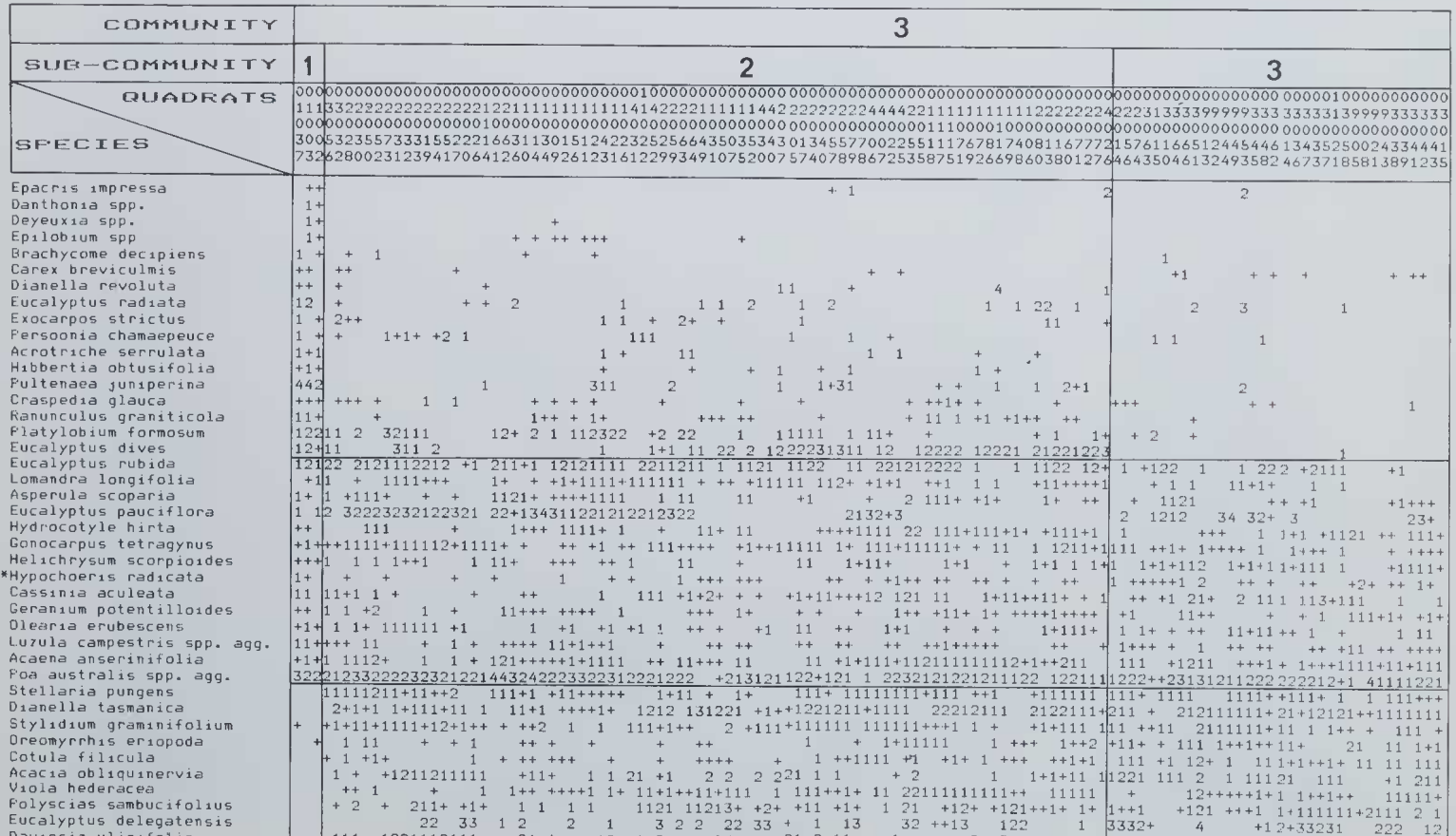

Brachycome aculeata
Helichrysum scorpioides
Stylidium graminifolium
Grevillea australis
Tasmannia xerophila
Asperula gunnii
Celmisia longifolia
*Trifolium repens
*Acetosella vulgaris
Viola betonicifolia
Oxylobium alpestre
Eucalyptus pauciflora
Leucopogon suaveolens
Stellaria pungens
Oreomyrrhis eriopoda
Cotula filicula
*Hypochaeris radicata
Luzula campestris spp. agg.
Acaena anserinifolia
Poa australis spp. agg.
Epilobium cinereum
Polystichum proliferum
Geranium potentilloides
Veronica derwentia
Prunella vulgaris
Viola hederacea
Arthropodium milleflorum
Scleranthus biflorus
Senecio lautus
*Cerastium glomeratum
Craspedia glauca
Oanthonia nudiflora
Agropyron scabrum
Oianella tasmanica
Olearia phlogopappa
Olearia erubescens
Hydrocotyle hirta
Rubus parvifolius
Oaviesia ulicifolia
Asperula scoparia
Eucalyptus rubida
Ranunculus graniticola
Lomandra longifolia
Lagenifera stipitata
Olearia megalophylla
Ranunculus plebeius
Pimelea linifolia
Wahlenbergia gloriosa
Oxalis corniculata
Acacia obliquinervia
Polyscias sambucifolius
Coprosma hirtella
Acacia dealbata

Table 2. Two-way table of Community 3.



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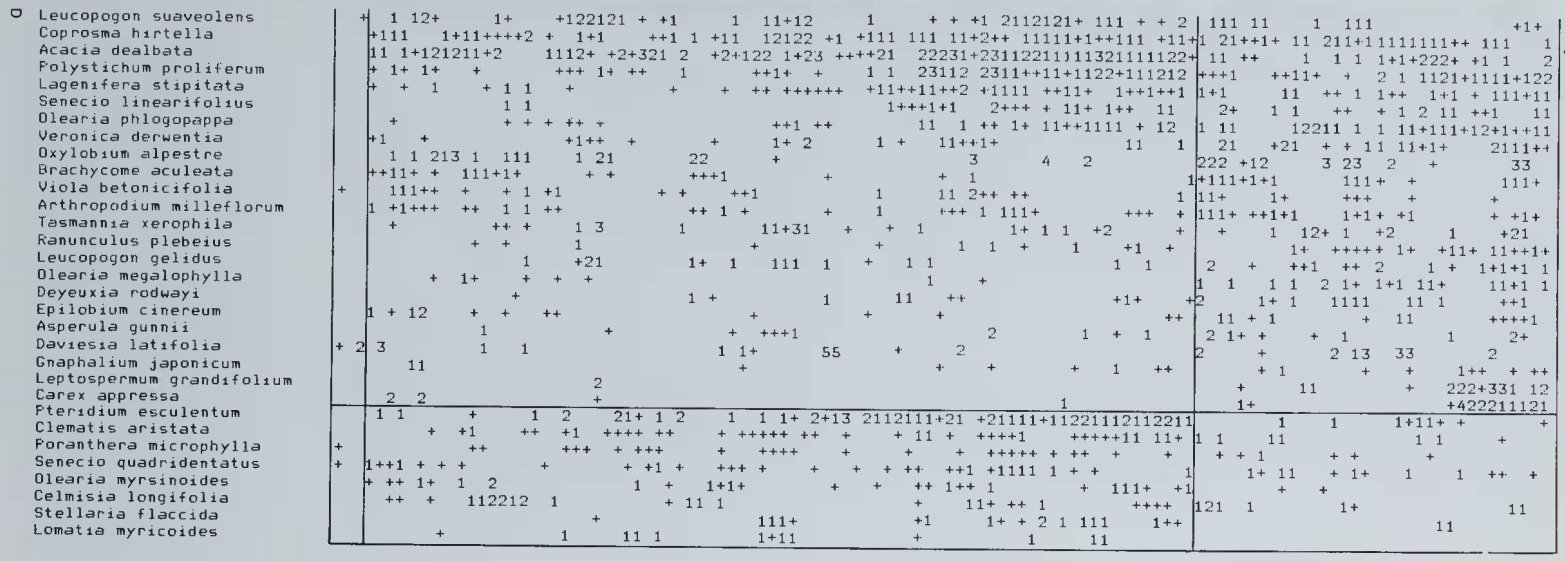
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Senecio linearifolius
Olearia phlogopappa
Veronica derwentia
Oxylobium alpestre
Brachycome aculeata
Viola betonicifolia
Arthropodium milleflorum
Tasmannia xerophila
Ranunculus plebeius
Leucopogon gelidus
Olearia megalophylla
Deyeuxia rodwayi
Epilobium cinereum
Asperula gunnii
Daviesia latifolia
Gnaphalium japonicum
Leptospermum grandifolium
Carex appressa
Pteridium esculentum
Clematis aristata
Poranthera microphylla
Senecio quadridentatus
Olearia myrsinoides
Celmisia longifolia
Stellaria flaccida
Lomatia myricoides

Table 3. Two-way table of Communities 4 and 5.

COMMUNITY	4		5
SUB-COMMUNITY	1	2	1
QUADRATS	000000000000	0000000000000000000000000000000	000000000 000000011111111111111001000111111111100000000 00000000000000
	333333211133	4444444444444244444442221142 1	444441111 11111111000000000000000001101440000000000000999999999 99999999999999
	000000000000	0000000000000000000000000000000	000000100 1010110100000000000000000110000000000000000000000000 00000000000000
	024666733825	4554415012333051111120005450 4	455000067 170801805433313444544444012622210054000031555443 22 22210000005466
SPECIES	369789532550	5732954380378290241944673051 2	168545867 269313021183229293287654618798608700324175971218 75 43079743218887
Eucalyptus delegatensis	++1+22121	3 1 1	2 + 2 1
Hypolepis rugosula	++ 1++ +	+ + + 1	1 + 1
Blechnum fluviatile	1111+11+1		1 + 2 + 1 + 1
Tasmannia lanceolata	2 2+1 1+1	1 +1+ +	+2 1 +2 1+2 +1 + 2 + 1 +
Daviesia latifolia	1221+ +	1 +1+ 1 1 +	+ + 1 + 1 +
Veronica derwentia	+1111	++1 11++ 1 +1 +	1 + 1 + +
Epilobium billardierianum	1 1 11 +1	1 + 11 1 ++ + +	+ +
Stellaria pungens	21+ 1 +	++ 1++++11+ 1 1+1 ++ +1++++	+ +1 +
Leptospermum grandifolium	+312 13 2 2	+ ++142 1+1 11+ 2 41	1 21 2
Rubus parvifolius	12+22 + 1+2	1111+ 11++11+212111+12121 +12	1 2 + 1 + + 1+ 1 1 + 1 1
Eucalyptus viminalis	12 11 13	22 21 1 113 2222 31212 11	231 2+ 1 1 1 11 2 2 1 3 3
Gnaphalium japonicum	1++1++ ++	++1 + 21+1 ++++ +++++1+ +	1+ + + 1+++ + +++ + + + 11 + + 1
Lagenifera stipitata	+1++ ++ +	+ +1++2++ + 111 11+ 1+	1 11 + + + +1 1
Cotula filicula	+11 1+ + +	++1 ++ + ++11111 ++ + 1 +	++++ 1 1 1+1 +1 + 1 ++ 1+ +1 1 + + ++
Carex appressa	1212 11 111	1+3 1 2313112311+ 211 2 1+241	1 1 1 11 + 1+ + 3+ + + 1 11 1 11 11 +1 ++
Poa australis spp. agg.	++223111 211	1 2 12111 1111111++ 111+ 22	121 1 2 +++ + 1 1 4 + ++ 1 1 11 ++ 2 1
Viola hederacea	1+1+ + +	+111 1111 11++11+1+1+1+1 11 1	++11 11 2111111111+ +1 1 1+111111+11 11 1+1 +12 111+++ + +1+1111 +1+
Acaena anserinifolia	+111211+ 112	+ 21 1+1+2111 11111121 11112	1 1 1 11 +111+11+11+1++111++2+111++1 11+++11+ + 1++11++11 + + +11+
Acacia dealbata	2 11121+ 12	+222111+1+++1222+ 112121+++	22 121112 22112111111 1 1 1112 221 211242111 +11223221132 +122 1 11+111
Hydrocotyle hirta	1111 + 111	+11 1211111+11111 1 11+ 1	2 +++11+ 1+1+1+ 1111+11+111121+11+ + 11+++11+ ++ 11+11+ 1+ +++++1+ + +
Cassinia aculeata	+ 1221++ 12	221 1211 222112+2112 +1+2	11211 + 12 11111111+ 121 11+21 ++12111 1 ++121 12+111 1 1 11212++++
*Hypochoeris radicata	+++1+ 1 +	11 +1 1112++ + +2 11 + 2	++1 1 11 + +1+2111++ 1 ++ + ++ ++ + +1 +2 +++ ++ +
Geranium potentilloides	+11111+ 111	1111++11+1111 1111++1111+ 1+	++ 1 111 12111+11111 1111112+ 11+1+1+++11+1 ++ 11 1 1 11 +11++ +
Polystichum proliferum	211132233+ 1	+1 13+ ++ 11212 2+1112++	+ 1334211 222 11+1211 1+1 121122+312212 131221++ +112331131 122121++ + 3
Stellaria flaccida	2 21 1+1 1	+ + +++ ++1 1111 1 +	+1 1 +112 1112 +1+1 2 111 1 1 2 1 + 11+2121 1 2 1 21 1 + 1
Polyscias sambucifolius	11+++ 1++	11 +11+ +1 1212+ +++ +	11++ 1 1 1 + + 1 +1 +++++1+2 1 11 222 1+11 1 +1++ +
Blechnum nudum	2 + ++ +1	112 2 1+1123111 2 123 5111	41 2 13+21 2 + +11221+1++1 2 ++ 1 2 2 +1
Urtica incisa	11 1221 1 1	+ 1 ++ ++ + +++	+ 13 1 2 +111+ + 1 21 11+1 2 11 + 11+ + ++
Clematis aristata	+ 1 + ++	+111 +1++ 111++111 +1111++ +	11111 + + 1++ +1+11+ 11+1+ 1111+11 1+111+1 11+ 1111+1 1+1 111211+1++211+
Pteridium esculentum	1+	1113+1211+1 +1 +1212221111 +1	++211 111 +1+1231 11121+++1 1++++ 211111++11+++1 1+ +1+ 1 ++1111 + +
Coprosma quadrifida	1 +2	11 ++1 21+12122222113211 1 1+	12 1 1+11+1+11 + 12111+1111+12 12+1211111 11 + 1 1 + 111+ 1 1113
Pomaderris aspera	1 21	12 111 1+ + +212 111112 1 1	2 21 113 31112 1 +1 11 + 11+322132132 112 31 1 12 2 2 2 1 32 1
Australina muelleri	2 1112111 1	1 + + 1 + +	1 1+ + 1++1 1 1 +1 21+21 2 111111 1 21231 +1 22+ 11 +11
Olearia phlogopappa	1111+2 2	+1 1 +1+1 1 1	1+11 2 11+1 112+ 313 + 2 11 + 21 ++11121121+ 111++2212 +1
Dicksonia antarctica	2 212145 +	1+ 1 + 1+ 1 21 1	+ 112 2 41+1 +1+++ + 1+ 2++11 21 312 3+2 1+++ 23222 +24 122 132++ 323+
Senecio linearifolius	+211211 1	11 11 + 1+1 1 +	1 142 111111121+1 +12 13 22111 111 1 1 +1 + 21++211+1 111 ++2+++
Oxalis corniculata	+ + 1	1 2 ++ 1 + + ++++1 +	1+ 11 1+ +++++ ++ + ++ 111+ 111+ + 1 + + + +
Dianella tasmanica	11 + +	+1++ 1+ 1+ 1113 + +	+1++ 11 ++++ + + + + 11+ + +++ 1 1 1 11 +
Lomatia fraseri	1 22	1 1 +1221 +11 +	11 1+ + + + 1+1 + + 1 ++1 + + +
Acacia melanoxylon	12	11 +1 11+121111+12111+2 11 +1	1 ++ 1 132 1 11+11 ++ 2111 2+21 11 1 2 221111
Prunella vulgaris	1+ +	1 + +11+21 +1+1 111+1 +1	++1++ + 11112 1++ + 1 ++ + + + + +
Prostanthera lasianthos	1 + +2	++ 1 1 121 1121 +	+11 + 1+2+1 1 11+2 1+ 11 +2 232 +21 1+14 2 2 21 11 ++1 + ++

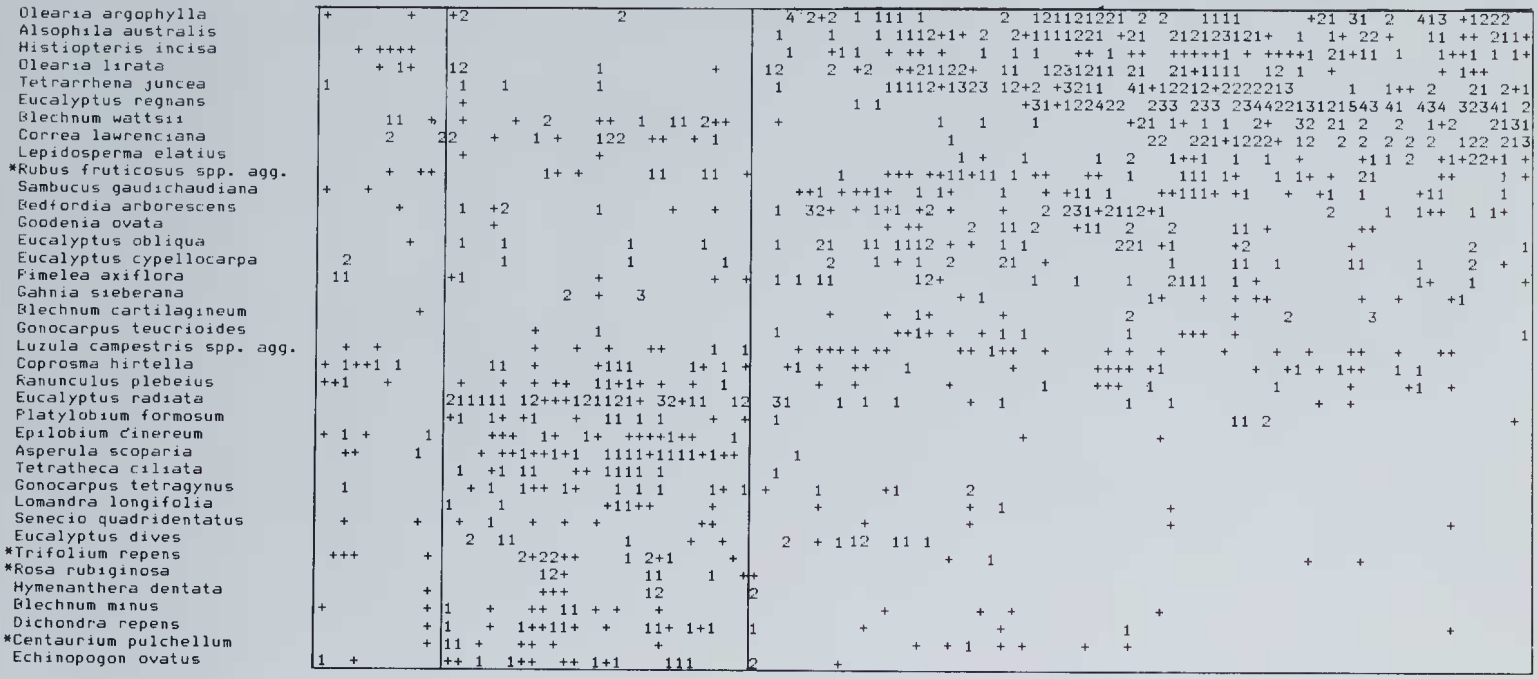
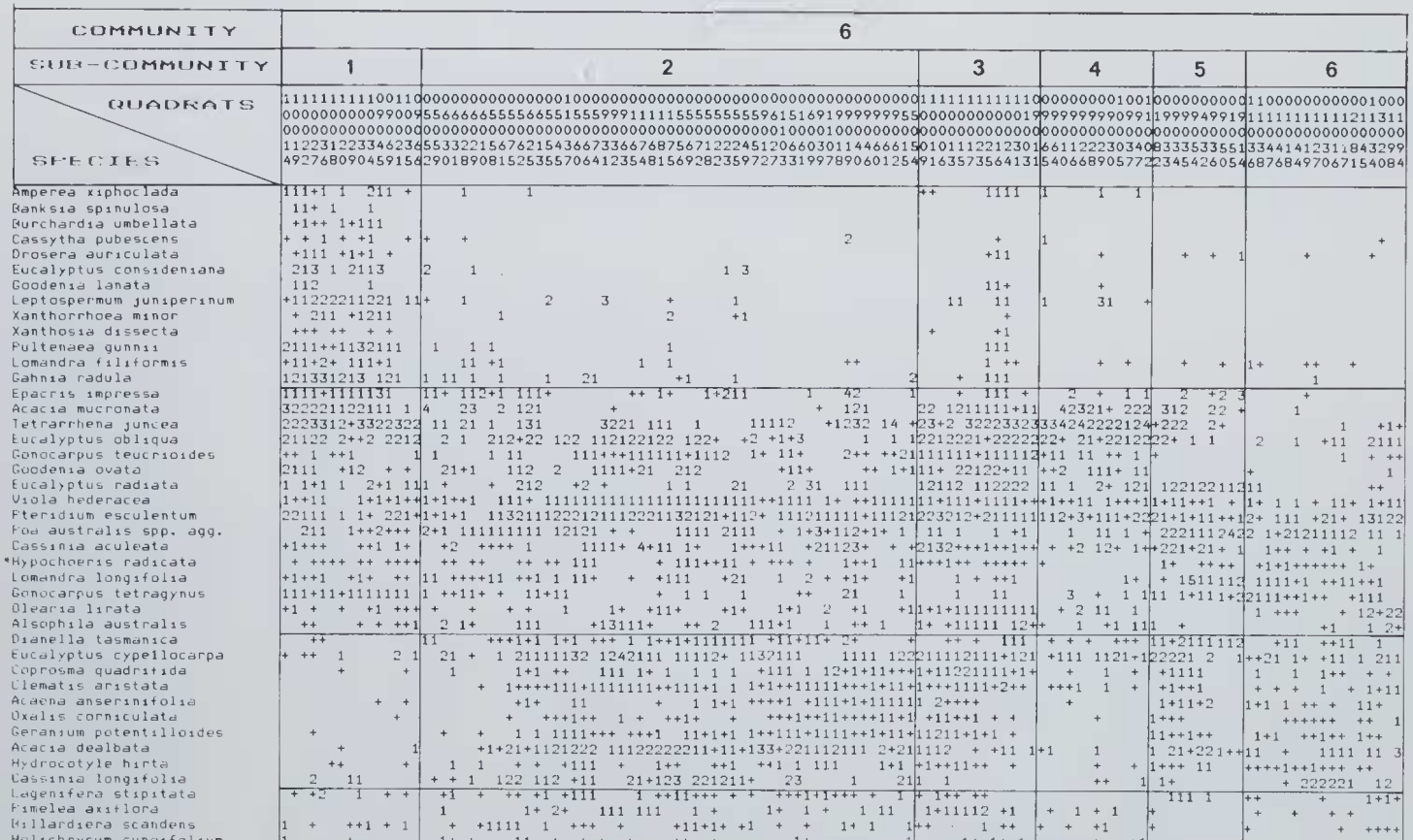

Olearia argophylla
Alsophila australis
Histiopteris incisa
Olearia lirata
Tetrarrhena juncea
Eucalyptus regnans
Blechnum wattsii
Correa lawrenciana
Lepidosperma elatius
*Rubus fruticosus spp. agg.
Sambucus gaudichaudiana
Bedfordia arborescens
Goodenia ovata
Eucalyptus obliqua
Eucalyptus cypellocarpa
Pimelea axiflora
Gahnia sieberana
Blechnum cartilagineum
Gonocarpus teucrioides
Luzula campestris spp. agg.
Coprosma hirtella
Ranunculus plebeius
Eucalyptus radiata
Platylobium formosum
Epilobium cinereum
Asperula scoparia
Tetratheca ciliata
Gonocarpus tetragynus
Lomandra longifolia
Senecio quadridentatus
Eucalyptus dives
*Trifolium repens
*Rosa rubiginosa
Hymenanthera dentata
Blechnum minus
Dichondra repens
*Centaurium pulchellum
Echinopogon ovatus

Table 4. Two-way table of Community 6.



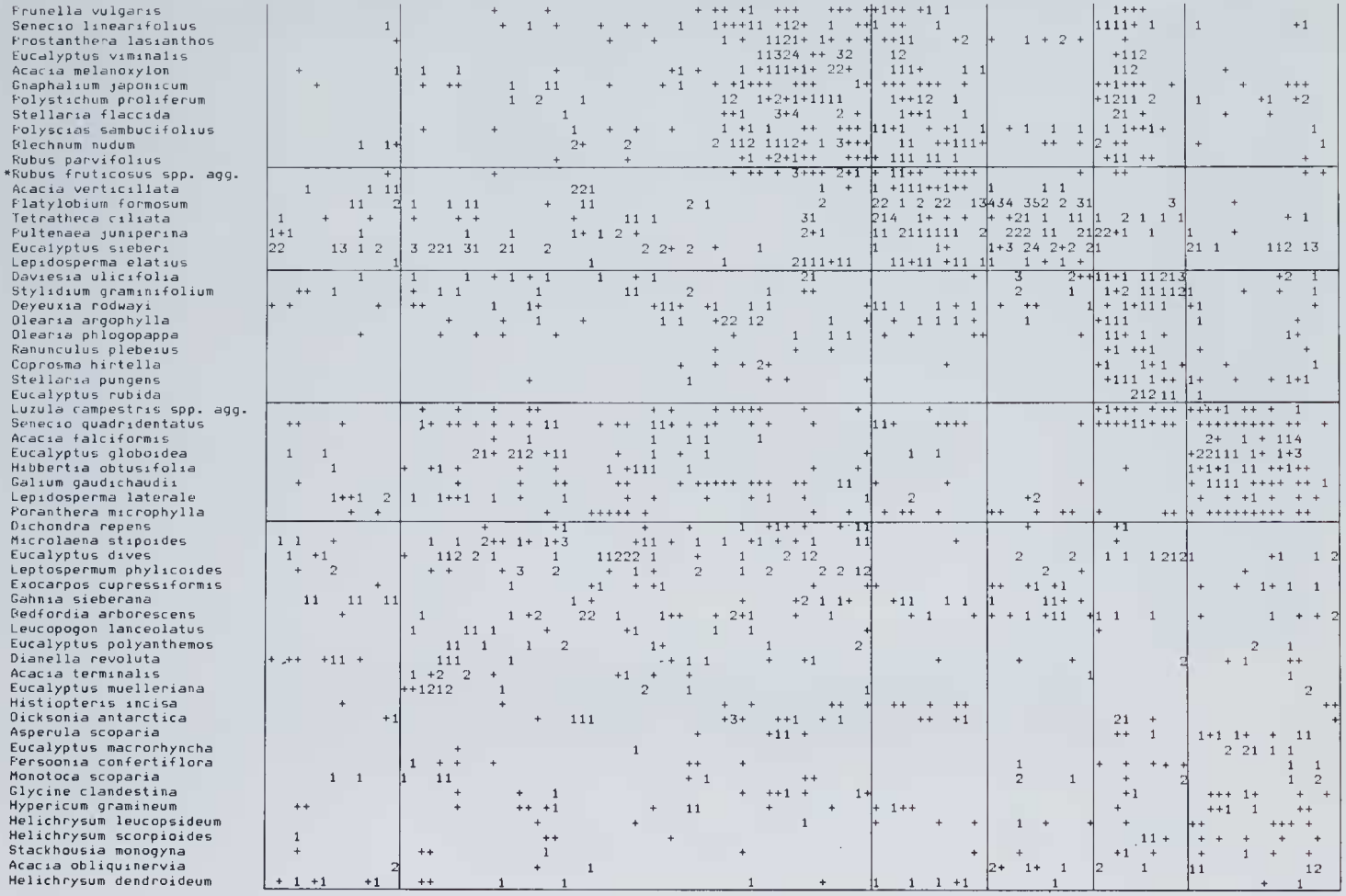
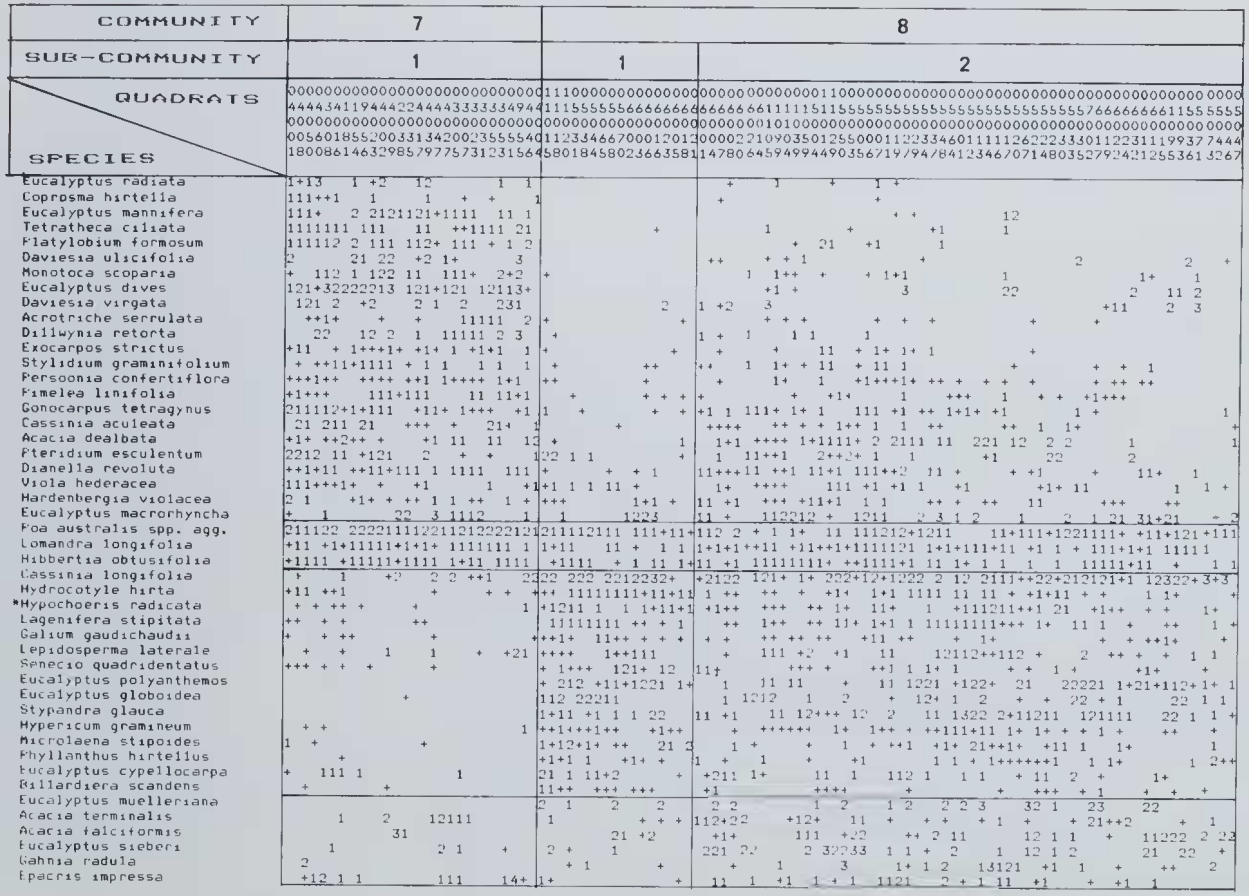
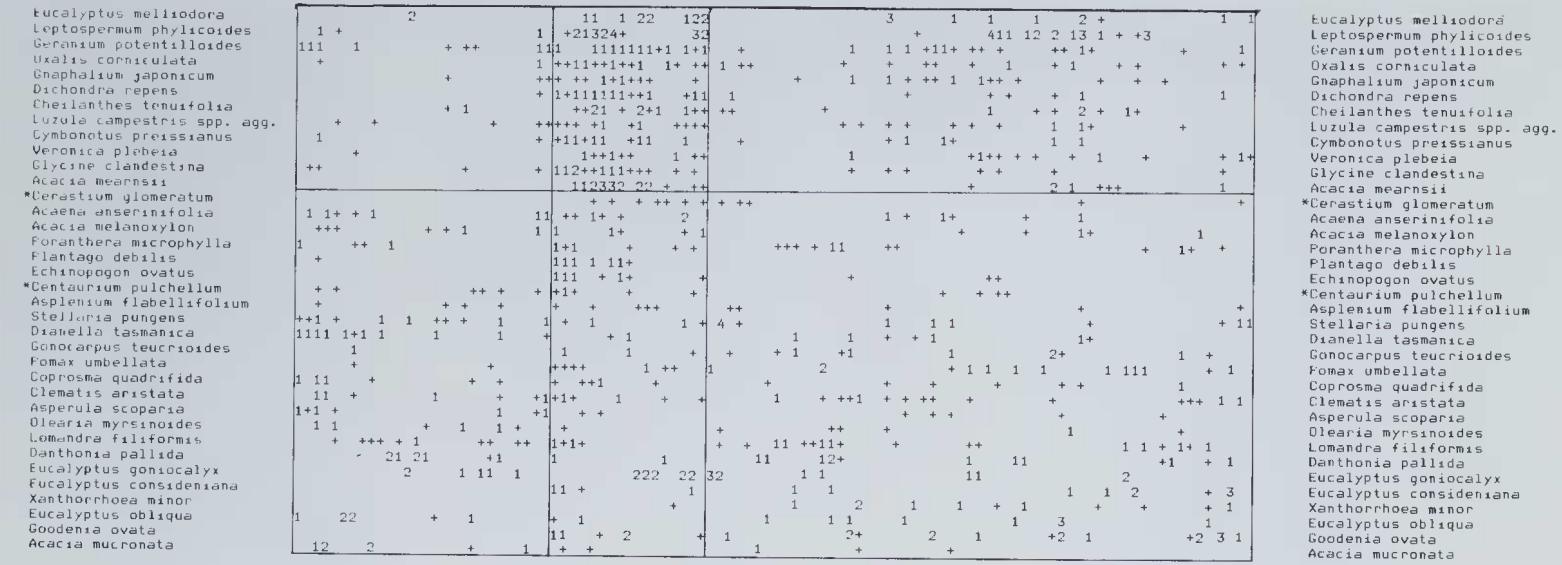

Prunella vulgaris
Senecio linearifolius
Prostanthera lasianthos
Eucalyptus viminalis
Acacia melanoxylon
Gnaphalium japonicum
Polystichum proliferum
Stellaria flaccida
Polyscias sambucifolius
Blechnum nudum
Rubus parvifolius
*Rubus fruticosus spp. agg.
Acacia verticillata
Platylobium formosum
Tetratheca ciliata
Pultenaea juniperina
Eucalyptus sieberi
Lepidosperma elatius
Daviesia ulicifolia
Stylidium graminifolium
Deyeuxia rodwayi
Olearia argophylla
Olearia phlogopappa
Ranunculus plebeius
Coprosma hirtella
Stellaria pungens
Eucalyptus rubida
Luzula campestris spp. agg.
Senecio quadridentatus
Acacia falciformis
Eucalyptus globoidea
Hibbertia obtusifolia
Galium gaudichaudii
Lepidosperma laterale
Poranthera microphylla
Dichondra repens
Microlaena stipoides
Eucalyptus dives
Leptospermum phylicoides
Exocarpos cupressiformis
Gahnia sieberana
Bedfordia arborescens
Leucopogon lanceolatus
Eucalyptus polyanthemos
Dianella revoluta
Acacia terminalis
Eucalyptus muelleriana
Histiopteris incisa
Dicksonia antarctica
Asperula scoparia
Eucalyptus macrorhyncha
Persoonia confertiflora
Monotoca scoparia
Glycine clandestina
Hypericum gramineum
Helichrysum leucopsideum
Helichrysum scorpioides
Stackhousia monogyna
Acacia obliquinervia
Helichrysum dendroideum

Table 5. Two-way table of Communities 7 and 8.



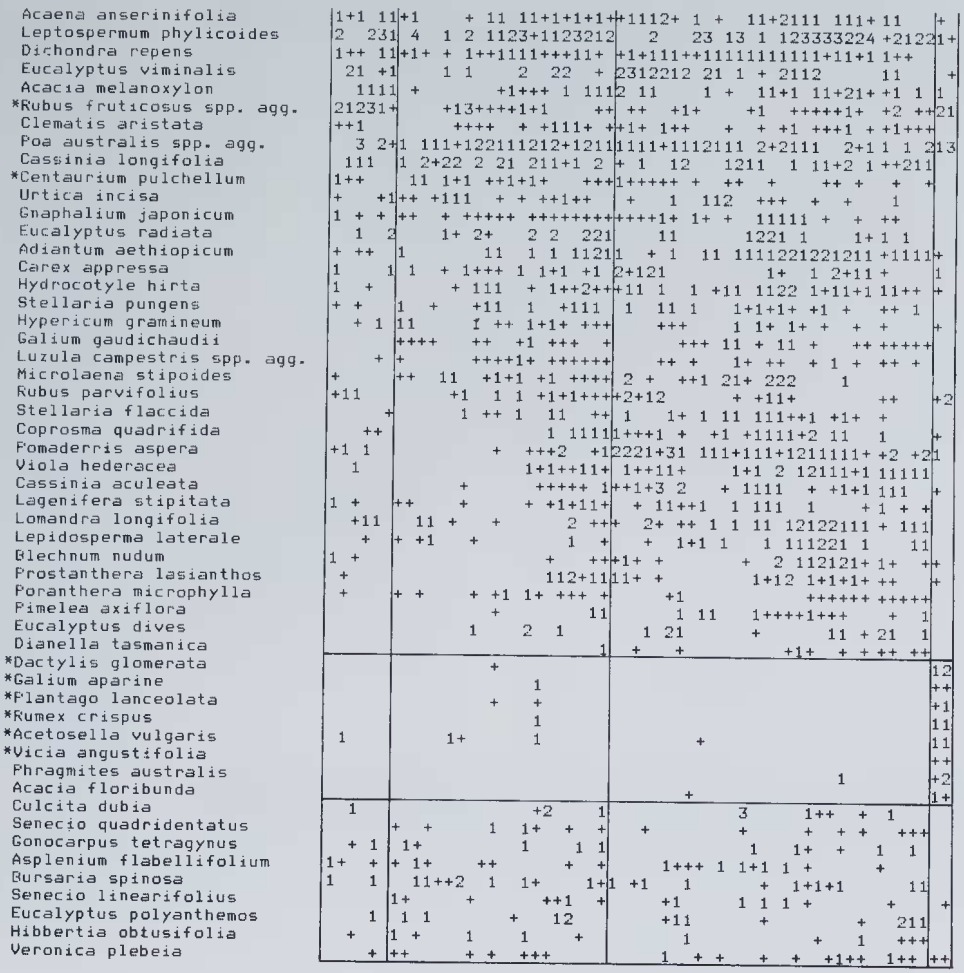
Eucalyptus radiata
Coprosma hirtella
Eucalyptus mannifera
Tetratheca ciliata
Platylobium formosum
Daviesia ulicifolia
Monotoca scoparia
Eucalyptus dives
Daviesia virgata
Acrotriche serrulata
Dillwynia retorta
Exocarpos strictus
Styliidium graminifolium
Persoonia confertiflora
Pimelea linifolia
Gonocarpus tetragynus
Cassinia aculeata
Acacia dealbata
Pteridium esculentum
Dianella revoluta
Viola hederacea
Hardenbergia violacea
Eucalyptus macrorhyncha
Poa australis spp. agg.
Lomandra longifolia
Hibbertia obtusifolia
Cassinia longifolia
Hydrocotyle hirta
*Hypochaoris radicata
Lagenifera stipitata
Galium gaudichaudii
Lepidosperma laterale
Senecio quadridentatus
Eucalyptus polyanthemos
Eucalyptus globoidea
Stypandra glauca
Hypericum gramineum
Microlaena stipoides
Phyllanthus hirtellus
Eucalyptus cypellocarpa
Billardiera scandens
Eucalyptus muelleriana
Acacia terminalis
Acacia falciformis
Eucalyptus sieberi
Gahnia radula
Epacris impressa



Eucalyptus melliodora
Leptospermum phylicoides
Geranium potentilloides
Oxalis corniculata
Gnaphalium japonicum
Dichondra repens
Cheilanthes tenuifolia
Luzula campestris spp. agg.
Cymbonotus preissianus
Veronica plebeia
Glycine clandestina
Acacia mearnsii
*Cerastium glomeratum
Acaena anserinifolia
Acacia melanoxylon
Poranthera microphylla
Plantago debilis
Echinopogon ovatus
*Centaurium pulchellum
Asplenium flabellifolium
Stellaria pungens
Dianella tasmanica
Gonocarpus teucrioides
Pomax umbellata
Coprosma quadrifida
Clematis aristata
Asperula scoparia
Olearia myrsinoides
Lomandra filiformis
Danthonia pallida
Eucalyptus goniocalyx
Eucalyptus consideniana
Xanthorrhoea minor
Eucalyptus obliqua
Goodenia ovata
Acacia mucronata

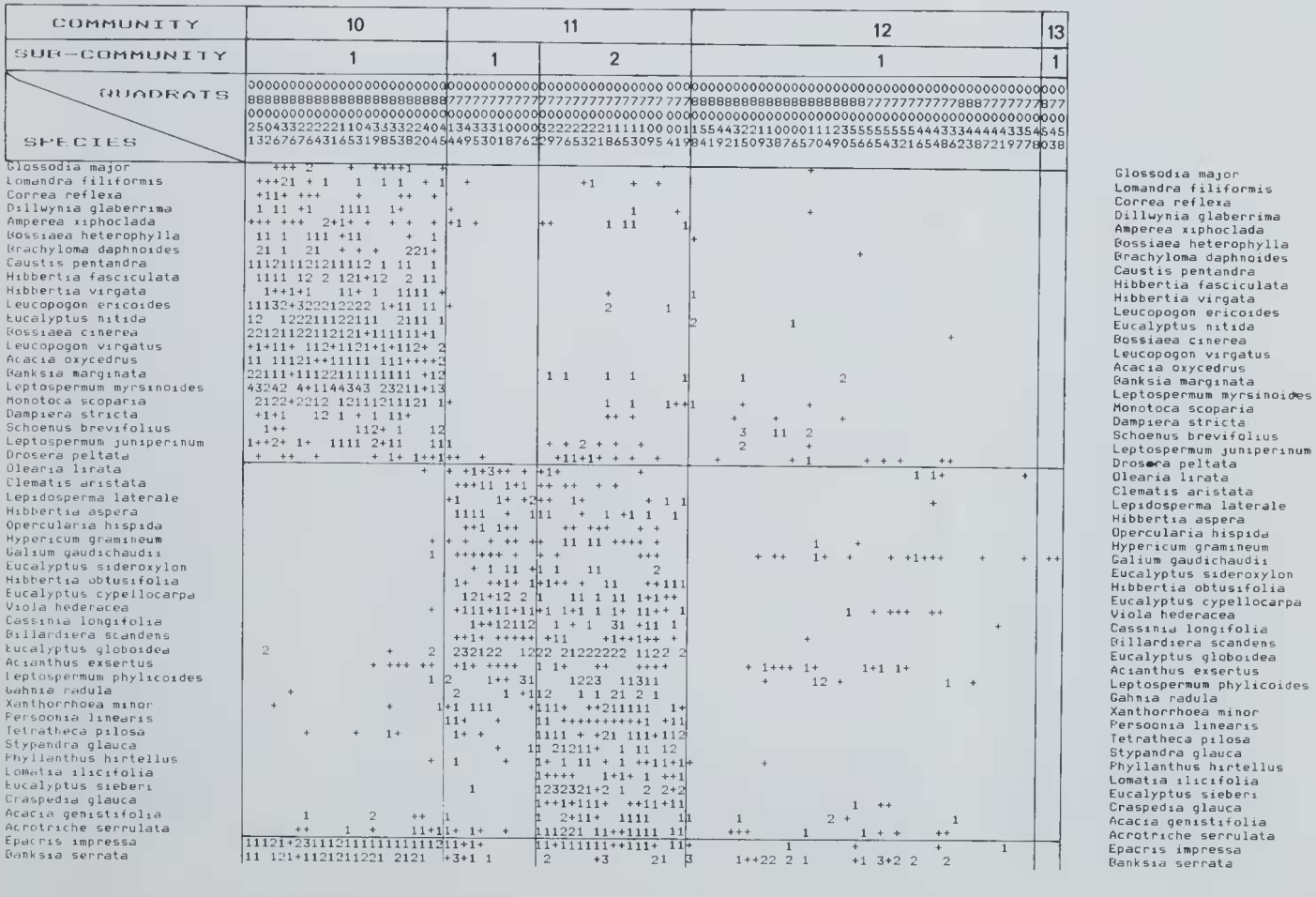
Table 6. Two-way table of Community 9.

COMMUNITY	9				
SUB-COMMUNITY	1	2	3	4	
QUADRATS / SPECIES	000000	1111111111111111111	00000000000000000000000 0000	00	
	222222	1111111111111111111	33333115555555555551111 1111	77	
	000000	0000000000000000000	00000000000000000000000 1000	00	
	336788	4420442334413330122	50223596134440000356876 0699	812	
	699023	4567265350161295978	06450424090133928210933 0270	820	
*Aira caryophyllea	+	+ 1 + 1+1+ + 1+	+ + +		*Aira caryophyllea
Deyeuxia quadriseta		+ 1 +++++ 1	+ 1		Deyeuxia quadriseta
*Sonchus asper		1+ ++1++ 1+++ +++			*Sonchus asper
*Sonchus oleraceus		+++++++ + +++ 1+		+	*Sonchus oleraceus
*Trifolium repens	+ +	+ 1 ++ + 11+ ++	+ ++		*Trifolium repens
Agropyron scabrum		1 1111++11 ++1+	+		Agropyron scabrum
Hydrocotyle laxiflora		+1+++ 1+1+1 1121	+		Hydrocotyle laxiflora
Crassula sieberiana	+	+ ++ + ++ + +			Crassula sieberiana
Eucalyptus macrorhyncha	1 1	2 11 11+11 +	1 + 1		Eucalyptus macrorhyncha
Danthonia racemosa	+	+1 2+1 1+ + 1 ++ +			Danthonia racemosa
Dichelachne crinita		+ 1++ 1+++ 1 1	+ +		Dichelachne crinita
Geranium retrorsum		+ 1 1+11 +11+			Geranium retrorsum
*Trifolium campestre		+1 1+1 1+11 +			*Trifolium campestre
Daucus glochidiatus		+++++ + 1 + ++			Daucus glochidiatus
*Vulpia bromoides	+	+ + ++++ + +++			*Vulpia bromoides
Dichelachne micrantha		+ 1 1++1+11 1++++	++		Dichelachne micrantha
Rumex brownii	+ +	111+111+11++ +1+++++	++ +11+11 1		Rumex brownii
Plantago debilis	+	+ + 1 + 1++11++1	1111+ +		Plantago debilis
Cheilanthes tenuifolia	+	++11 1 +1+++1+ ++	+1 11 1		Cheilanthes tenuifolia
Glycine clandestina	1 +	+1 ++ +11111+ +11++	+ ++1 + +1111 +		Glycine clandestina
*Conyza bonariensis	+++	1+1+1++1 + +11+ ++	+ 1 + +++1 + +	1+	*Conyza bonariensis
Echinopogon ovatus	+ + +	11+ 1 1+11111+12111+	+ 11 + + +1+ ++ + 1		Echinopogon ovatus
*Cerastium glomeratum	+ ++	+ + + 1+++ + + 1++	+ + + + +	+1	*Cerastium glomeratum
*Anagallis arvensis	1++ +	++++++1++ 11++ 11+ +	+ + + +	+	*Anagallis arvensis
*Hypericum perforatum	1+ 1	212+ 11212 1 2 +	1		*Hypericum perforatum
*Rosa rubiginosa	1+1 11	+11 +1 ++1+ +1	1+ 1 + + +	1	*Rosa rubiginosa
Hymenanthera dentata	1+1111	+ 11+ 11 ++111	+ 1+1 1	1	Hymenanthera dentata
Eucalyptus melliodora	21111	1 1 22+11+2+ 1 111+	1 1 1 1	1	Eucalyptus melliodora
*Cirsium vulgare	+++ 2	+ +++++1+++ +1++1	+++ +++1 +	++	*Cirsium vulgare
Acacia mearnsii	1 1+1	1121+ 1 1212 1 2 +	143 +211	1	Acacia mearnsii
Eucalyptus bridgesiana	1 113	+ 2 22 1 +1 2111	111 112 2 1 2111 121 221		Eucalyptus bridgesiana
Prunella vulgaris	1++1	+ +1 +++11111+	+ ++ 1 1 111 ++111+ +1	+	Prunella vulgaris
*Hypochoeris radicata	++11	+++ 1+1111111111+++	+ +1 + 1 ++1 21221++++++ ++++	+1	*Hypochoeris radicata
Pteridium esculentum	+42 1	1 +21 12+ 1+123111+	131+111 1 11211 1111 +1 11+1	12	Pteridium esculentum
Acacia dealbata	21111	+ 111 1111 11+	13112111 +1 1 1111 11 1 232	1	Acacia dealbata
Geranium potentilloides	1++ 1	1 11 1 ++ +	+ 1+1 +121+111+21+1++1+ +1++	1+	Geranium potentilloides
Oxalis corniculata	++1 11	1++++11+++ 1++111+ 1	+ + 11+11 ++11+1++1++ +1+ +		Oxalis corniculata

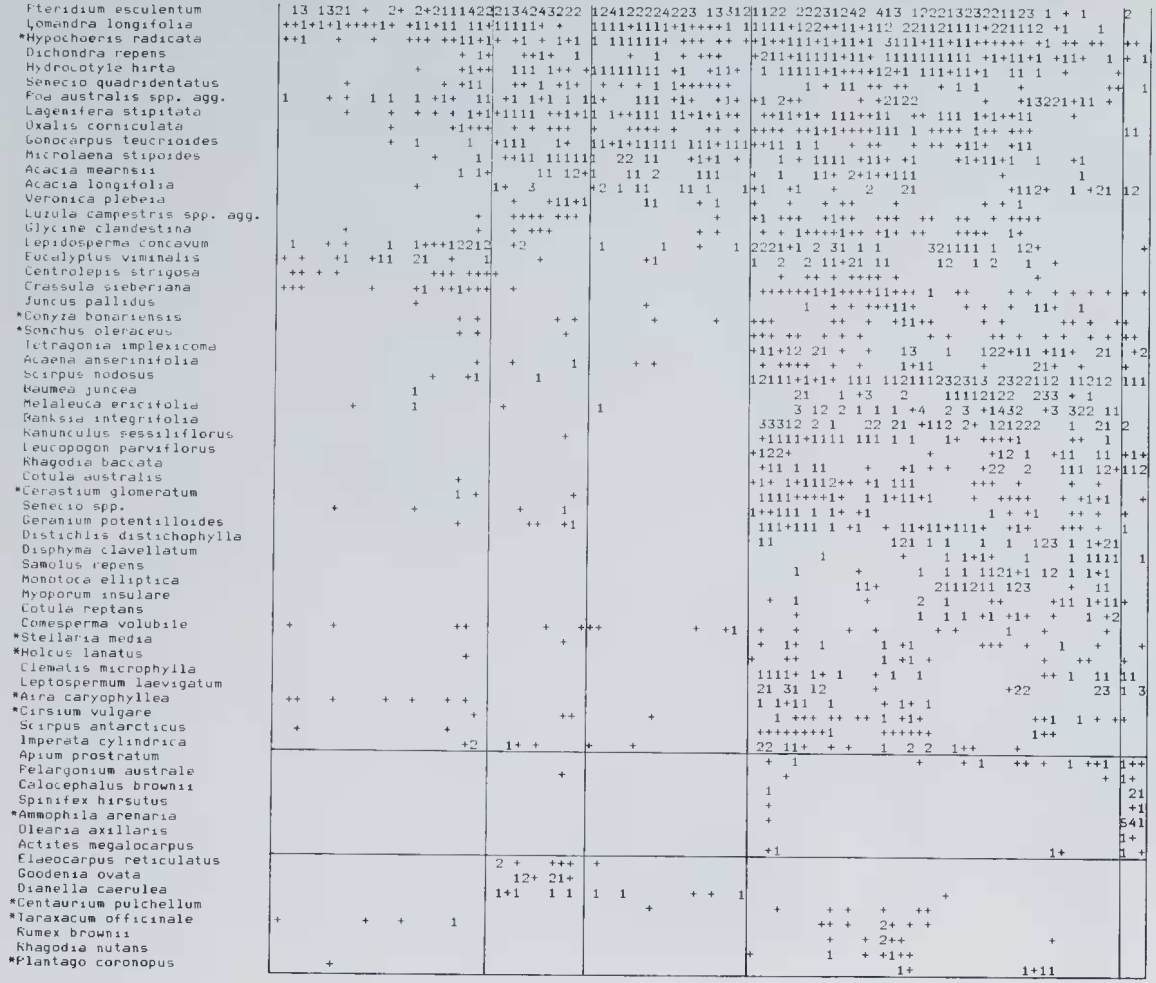


Acaena anserinifolia
Leptospermum phylicoides
Dichondra repens
Eucalyptus viminalis
Acacia melanoxylon
*Rubus fruticosus spp. agg.
Clematis aristata
Poa australis spp. agg.
Cassinia longifolia
*Centaurium pulchellum
Urtica incisa
Gnaphalium japonicum
Eucalyptus radiata
Adiantum aethiopicum
Carex appressa
Hydrocotyle hirta
Stellaria pungens
Hypericum gramineum
Galium gaudichaudii
Luzula campestris spp. agg.
Microlaena stipoides
Rubus parvifolius
Stellaria flaccida
Coprosma quadrifida
Pomaderris aspera
Viola hederacea
Cassinia aculeata
Lagenifera stipitata
Lomandra longifolia
Lepidosperma laterale
Blechnum nudum
Prostanthera lasianthos
Poranthera microphylla
Pimelea axiflora
Eucalyptus dives
Dianella tasmanica
*Dactylis glomerata
*Galium aparine
*Plantago lanceolata
*Rumex crispus
*Acetosella vulgaris
*Vicia angustifolia
Phragmites australis
Acacia floribunda
Culcita dubia
Senecio quadridentatus
Gonocarpus tetragynus
Asplenium flabellifolium
Bursaria spinosa
Senecio linearifolius
Eucalyptus polyanthemos
Hibbertia obtusifolia
Veronica plebeia

Table 7. Two-way table of Communities 10, 11, 12, 13.

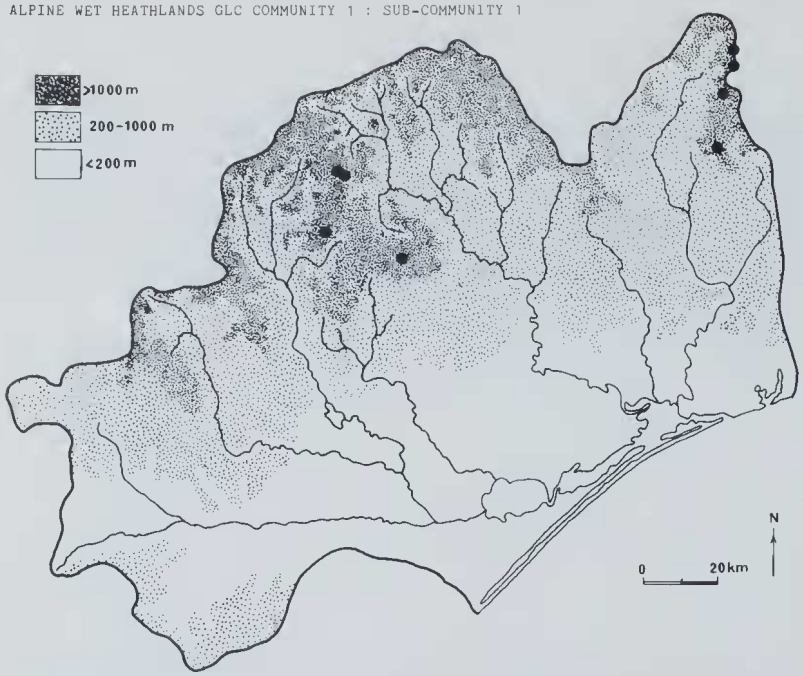


Glossodia major
Lomandra filiformis
Correa reflexa
Dillwynia glaberrima
Amperea xiphoclada
Bossiaea heterophylla
Brachyloma daphnoides
Caustis pentandra
Hibbertia fasciculata
Hibbertia virgata
Leucopogon ericoides
Eucalyptus nitida
Bossiaea cinerea
Leucopogon virgatus
Acacia oxycedrus
Banksia marginata
Leptospermum myrsinoides
Monotoca scoparia
Dampiera stricta
Schoenus brevifolius
Leptospermum juniperinum
Drosera peltata
Olearia lirata
Clematis aristata
Lepidosperma laterale
Hibbertia aspera
Opercularia hispida
Hypericum gramineum
Galium gaudichaudii
Eucalyptus sideroxylon
Hibbertia obtusifolia
Eucalyptus cypellocarpa
Viola hederacea
Cassinia longifolia
Billardiera scandens
Eucalyptus globoidea
Acianthus exsertus
Leptospermum phylicoides
Gahnia radula
Xanthorrhoea minor
Persoonia linearis
Tetratheca pilosa
Stypandra glauca
Phyllanthus hirtellus
Lomatia ilicifolia
Eucalyptus sieberi
Craspedia glauca
Acacia genistifolia
Acrotriche serrulata
Epacris impressa
Banksia serrata



Pteridium esculentum
Lomandra longifolia
*Hypochoeris radicata
Dichondra repens
Hydrocotyle hirta
Senecio quadridentatus
Poa australis spp. agg.
Lagenifera stipitata
Oxalis corniculata
Gonocarpus teucrioides
Microlaena stipoides
Acacia mearnsii
Acacia longifolia
Veronica plebeia
Luzula campestris spp. agg.
Glycine clandestina
Lepidosperma concavum
Eucalyptus viminalis
Centrolepis strigosa
Crassula sieberiana
Juncus pallidus
*Conyza bonariensis
*Sonchus oleraceus
Tetragonia implexicoma
Acaena anserinifolia
Scirpus nodosus
Baumea juncea
Melaleuca ericifolia
Banksia integrifolia
Ranunculus sessiliflorus
Leucopogon parviflorus
Rhagodia baccata
Cotula australis
*Cerastium glomeratum
Senecio spp.
Geranium potentilloides
Distichlis distichophylla
Disphyma clavellatum
Samolus repens
Monotoca elliptica
Myoporum insulare
Cotula reptans
Comesperma volubile
*Stellaria media
*Holcus lanatus
Clematis microphylla
Leptospermum laevigatum
*Aira caryophyllea
*Cirsium vulgare
Scirpus antarcticus
Imperata cylindrica
Apium prostratum
Pelargonium australe
Calocephalus brownii
Spinifex hirsutus
*Ammophila arenaria
Olearia axillaris
Actites megalocarpus
Elaeocarpus reticulatus
Goodenia ovata
Dianella caerulea
*Centaurium pulchellum
*Taraxacum officinale
Rumex brownii
Rhagodia nutans
*Plantago coronopus

ALPINE WET HEATHLANDS GLC COMMUNITY 1 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Baeckea gunniana	100	2
Empodisma minus	100	3
Epacris paludosa	100	2
Epacris breviflora	75	1
Hakea microcarpa	75	1
Poa australis spp. agg.	63	1
Asperula gunnii	63	1
Callistemoh sieberi	63	2
Comesperma retusum	63	+
Epacris microphylla	63	1
Gonocarpus micranthus	63	1
Sphagnum spp.	63	2

NO. OF SITES : 8 (1.1% of total)

DISTRIBUTION : Restricted to the higher plateaux of the study area - Nunniong Plateau north of Ensay and Snowy Range north of Licola.

ENVIRONMENT : Exposed, damp depressions within high altitude plains.

ALTITUDE : Mean = 1332m, Highest = 1500m, Lowest = 1040m

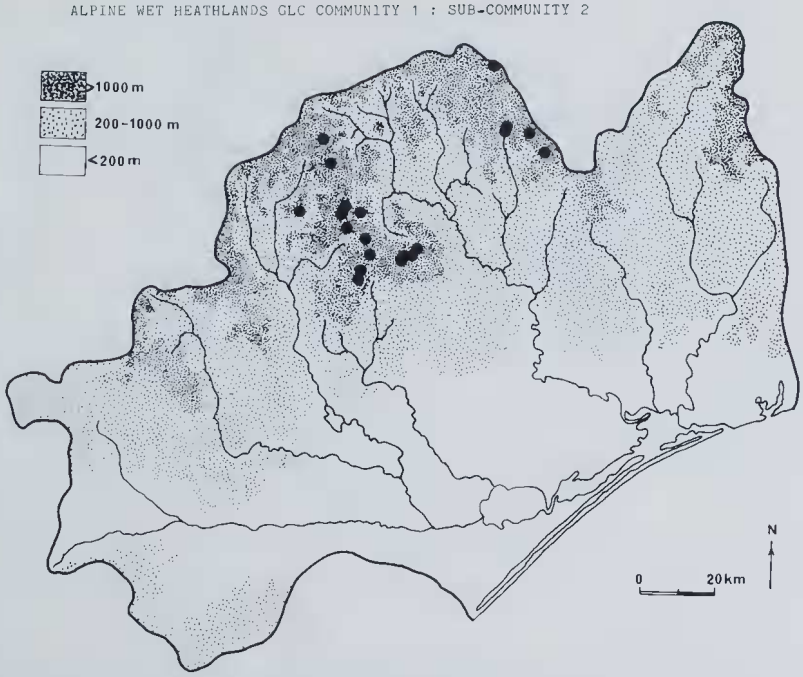
STRUCTURE : Closed heath

MEAN FLORISTIC RICHNESS : 32 species per site

MEAN WEED COMPOSITION : 2% of species, 1% of cover

NOTES : This sub-community is an alpine heath, containing several species which are characteristic of no other sub-community. This is the only sub-community in the alpine/subalpine range which is effectively devoid of a eucalypt canopy. Alpine heathlands are quite widespread in Victoria but the area they occupy is very small. Consequently the eight sites represented in this study although indicative of the area covered by this sub-community, are inadequate as descriptors of the variation in these complex communities.

ALPINE WET HEATHLANDS GLC COMMUNITY 1 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	100	1
Acaena anserinifolia	91	1
Eucalyptus pauciflora	83	1
*Hypochoeris radicata	83	+
Cotula filicula	83	+
Celmisia longifolia	78	+
Epacris paludosa	74	2
Baeckea gunniana	74	2
Stellaria pungens	74	1
Empodisma minus	74	1
Gonocarpus tetragynus	74	+
Stylidium graminifolium	74	1
Grevillea australis	70	1
Callistemon sieberi	70	1
Leucopogon suaveolens	65	1
Luzula campestris spp. agg.	65	+
*Trifolium repens	61	1
Carex appressa	61	2
Helichrysum scorpioides	61	1
Asperula gunnii	61	1
Tasmannia xerophila	61	1
Oxylobium alpestre	61	1
Deyeuxia quadriseta	61	+
Viola hederacea	61	+
Blechnum pennamarina	57	1
Oreomyrrhis eriopoda	57	1
Viola betonicifolia	57	+
Bossiaea foliosa	57	1
Hydrocotyle hirta	52	1
Carex breviculmis	52	+
Leptorhynchos squamatus	52	+
*Acetosella vulgaris	52	1

NO. OF SITES : 23 (3.3% of total)

DISTRIBUTION : Confined largely to the Snowy Range region but also occurring north of Mt. Baw Baw, near Matlock and near Mt. Tabletop & Phipps south of the Omeo to Hotham Heights road.

ENVIRONMENT : High altitude plains either fringing areas like sub-community 1.1 or in slightly more sheltered situations.

ALTITUDE : Mean = 1336m, Highest = 1630m, Lowest = 1020m

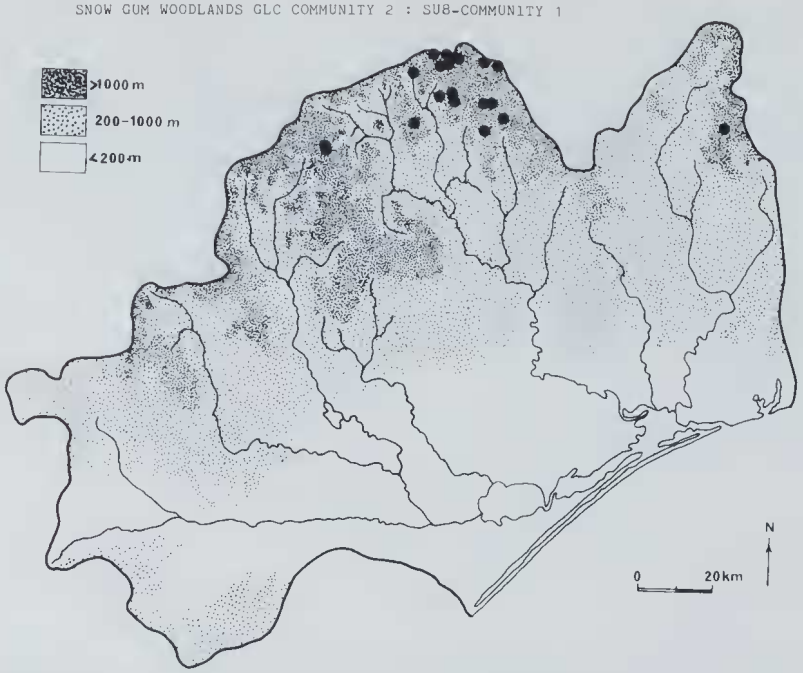
STRUCTURE : Low open-woodland to closed heath.

MEAN FLORISTIC RICHNESS : 52 species per site

MEAN WEED COMPOSITION : 5% of species, 4% of cover

NOTES : Although this sub-community is an alpine woodland, the shrubs and herbs it shares with sub-community 1.1 reflect its affinities with a damp alpine heath.

SNOW GUM WOODLANDS GLC COMMUNITY 2 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	96	2
Stellaria pungens	96	1
Eucalyptus pauciflora	92	2
Viola betonicifolia	88	1
Oreomyrrhis eriopoda	84	1
Oxylobium alpestre	80	2
*Acetosella vulgaris	80	1
*Hypochoeris radicata	80	1
Acaena anserinifolia	80	1
Geranium potentilloides	80	1
Leucopogon suaveolens	80	1
Cotula filicula	76	+
Tasmannia xerophila	72	1
Luzula campestris spp. agg.	72	+
Polystichum proliferum	72	1
Epilobium cinereum	68	1
Arthropodium milleflorum	60	+
Scleranthus biflorus	60	+
Senecio lautus	60	1
Celmisia longifolia	56	1
*Cerastium glomeratum	56	+
*Trifolium repens	56	1
Olearia phlogopappa	52	1
Craspedia glauca	52	1
Brachycome aculeata	52	1
Danthonia nudiflora	52	+
Prunella vulgaris	48	+
Asperula gunnii	48	1
Agropyron scabrum	48	+
Helichrysum scorpioides	48	1

NO. OF SITES : 25 (3.5% of total)

DISTRIBUTION : Occurs on higher ridges of the Great Dividing Range in the Mt. Hotham region, along the northern extremities of the Snowy Range, and with isolated occurrences on the Dargo High Plains and near Mt. Bindi, north of Ensay.

ENVIRONMENT : Ridgetops and nearby slopes, frequently with exposed basalt outcrops. Drier slopes than those supporting community 1.

ALTITUDE : Mean = 1476m, Highest = 1703m, Lowest = 1300m

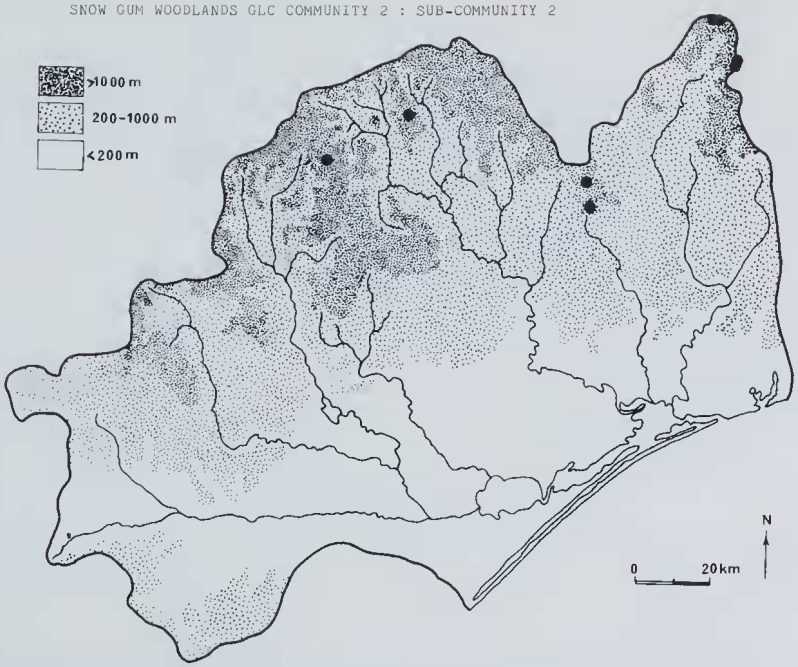
STRUCTURE : Low woodland

MEAN FLORISTIC RICHNESS : 42 species per site

MEAN WEED COMPOSITION : 9% of species, 8% of cover

NOTES : This sub-community embraces what is commonly known as Snow Gum Woodland. It contains a wide variety of low perennial herbs and grasses forming a dense ground layer. The shrub layer is usually less than 1.5m and comparatively sparse.

SNOW GUM WOODLANDS GLC COMMUNITY 2 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Acaena anserinifolia	88	1
Ranunculus graniticola	88	+
Stellaria pungens	88	+
Poa australis spp. agg.	88	2
Luzula campestris spp. agg.	75	1
Geranium potentilloides	75	1
Leucopogon suaveolens	75	1
Oreomyrrhis eriopoda	75	1
Asperula scoparia	63	+
Olearia erubescens	63	1
Celmisia longifolia	63	1
Eucalyptus pauciflora	63	2

NO. OF SITES : 8 (1.1% of total)

DISTRIBUTION : Scattered along the Great Dividing Range from the Snowy Range to the Bowen Mountains.

ENVIRONMENT : Well drained slopes grading to moister flats or depressions.

ALTITUDE : Mean = 1337m, Highest = 1600m, Lowest = 980m.

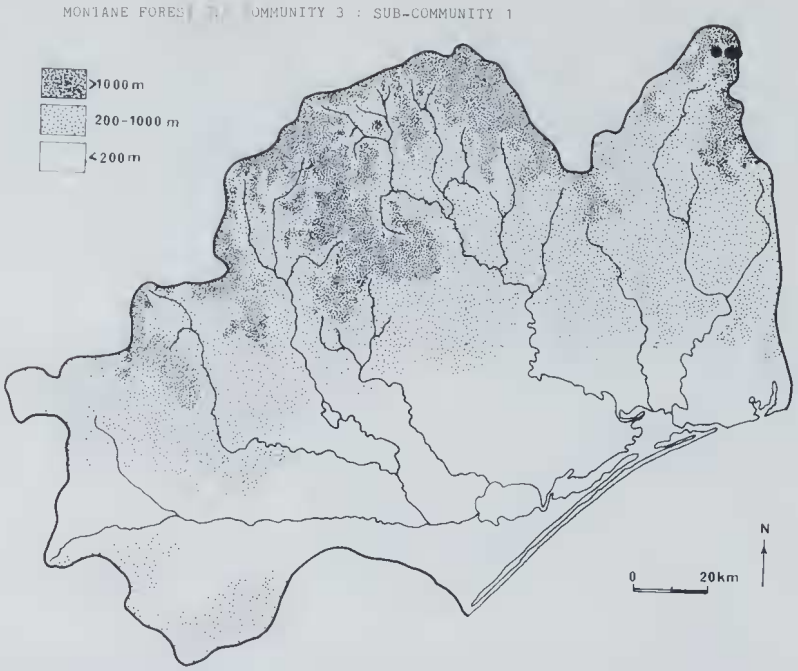
STRUCTURE : Low woodland

MEAN FLORISTIC RICHNESS : 33 species per site

MEAN WEED COMPOSITION : 4% of species, 3% of cover

NOTES : A species poor version of sub-community 2.1 with some affinities for sub-community 1.2 (e.g. the presence of wetland species such as *Leptospermum grandifolium*, *Carex appressa* and *Eucalyptus stellulata* in some of the sites of this sub-community.

MONTANE FORES[illegible]OMMUNITY 3 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Acaena anserinifolia	100	+
Acrotriche serrulata	100	1
Craspedia glauca	100	+
Eucalyptus dives	100	1
Eucalyptus rubida	100	1
Gonocarpus tetragynus.	100	+
Helichrysum scorpioides	100	+
Hibbertia obtusifolia	100	+
Luzula campestris spp. agg.	100	1
Olearia erubescens	100	+
Platylobium formosum	100	1
Pultenaea juniperina	100	3
Ranunculus graniticola	100	1
Poa australis spp. agg.	100	2
Epacris impressa	67	+
Lomandra longifolia	67	1
Danthonia spp.	67	1
Deyeuxia spp.	67	1
Epilobium spp.	67	1
Asperula scoparia	67	1
Brachycome decipiens	67	1
Carex breviculmis	67	+
Cassinia aculeata	67	1
Daviesia latifolia	67	1
Dianella revoluta	67	+
Eucalyptus pauciflora	67	1
Eucalyptus radiata	67	1
Exocarpus strictus	67	1
Geranium potentilloides	67	+
Hydrocotyle hirta	67	+
Hypericum gramineum	67	+
*Hypochoeris radicata	67	1
Persoonia chamaepeuce	67	1

NO. OF SITES : 3 (0.4% of total)

DISTRIBUTION : Confined to the north-east of the study area in the Nunniong Plateau area.

ENVIRONMENT : Well drained slopes of northerly to northwesterly aspect.

ALTITUDE : Mean = 1156m, Highest = 1270m, Lowest = 1000m.

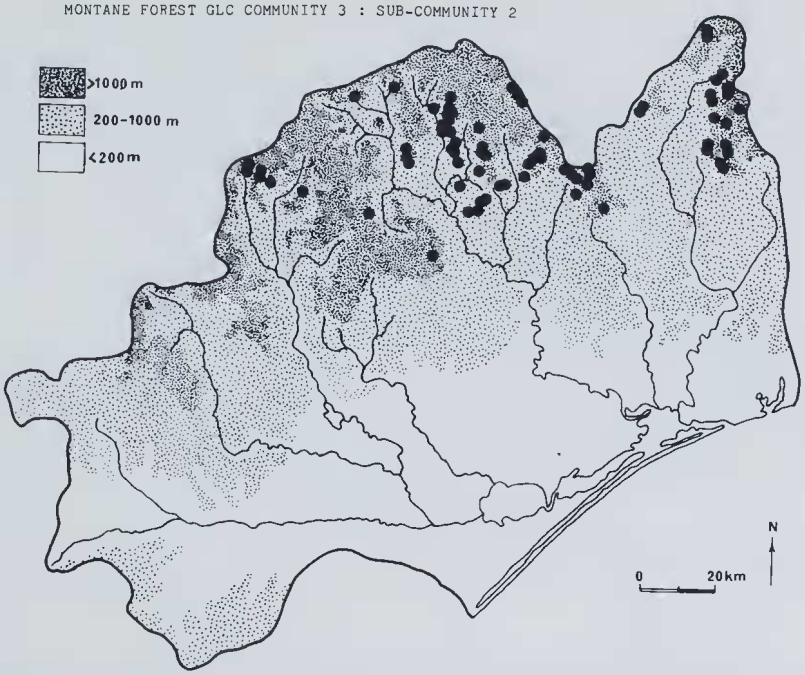
STRUCTURE : Low woodland

MEAN FLORISTIC RICHNESS : 33 species per site

MEAN WEED COMPOSITION : 3% of species, 2% of cover

NOTES : A very species poor version of sub-community 3.2

MONTANE FOREST GLC COMMUNITY 3 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	94	2
Acacia dealbata	86	1
Dianella tasmanica	82	1
Eucalyptus rubida	81	1
Gonocarpus tetragynus	81	1
Acaena anserinifolia	77	1
Coprosma hirtella	77	1
Stellaria pungens	76	1
Stylidium graminifolium	76	1
Lomandra longifolia	71	1
Viola hederacea	68	1
Polyscias sambucifolius	63	1
Pteridium esculentum	60	1
Polystichum proliferum	59	1
Hydrocotyle hirta	58	1
Cassinia aculeata	56	1
Eucalyptus dives	56	1
Lagenifera stipitata	55	+
Daviesia ulicifolia	54	1
Geranium potentilloides	54	+
Eucalyptus pauciflora	54	2
Leucopogon suaveolens	53	1
Luzula campestris spp. agg.	53	+
Asperula scoparia	53	1
Acacia obliquinervia	51	1
Cotula filicula	51	+
Olearia erubescens	51	1
Clematis aristata	50	+
Platylobium formosum	49	1
Helichrysum scorpioides	47	1
Senecio quadridentatus	42	+
Olearia phlogopappa	38	1
Oreomyrrhis eriopoda	38	1
Arthropodium milleflorum	38	+
Eucalyptus delegatensis	37	2
*Hypochoeris radicata	36	+
Olearia myrsinoides	36	1

NO. OF SITES : 80 (11% of total)

DISTRIBUTION : Frequent on sheltered slopes forming the catchments of the Macalister and Wonnangatta Rivers and up to the Great Dividing Range from Mt. Hotham to the Nunniong Plateau.

ENVIRONMENT : Moist and sheltered subalpine slopes.

ALTITUDE : Mean = 1187m, Highest = 1440m, Lowest = 860m.

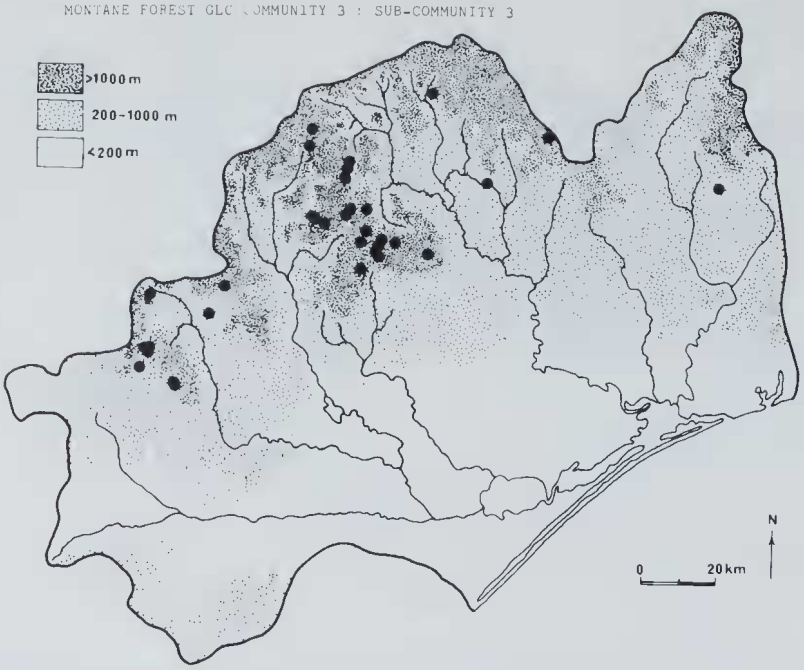
STRUCTURE : Open to Tall open-forest

MEAN FLORISTIC RICHNESS : 37 species per site

MEAN WEED COMPOSITION : 2% of species, 1% of cover

NOTES : The structural variation in the sub-community is related to the presence or absence of the four major species of *Eucalyptus*; *E. pauciflora*, *E. rubida*, *E. dives* and *E. delegatensis*. Where *E. delegatensis* occurs in significant quantities the forest is of considerable value for timber production and is usually of the structural type Tall open-forest. Where the other species dominate the structural type is open-forest. Despite this structural variation there is a strong floristic uniformity throughout sub-community 3.2

MONTANE FOREST GLC COMMUNITY 3 : SUB-COMMUNITY 3



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	97	1
Dianella tasmanica	91	1
Acaena anserinifolia	82	1
Polyscias sambucifolius	79	1
Coprosma hirtella	79	1
Stellaria pungens	76	1
Helichrysum scorpioides	74	1
Cotula filicula	74	1
Polystichum proliferum	74	1
Stylidium graminifolium	74	1
Olearia phlogopappa	74	1
Oreomyrrhis eriopoda	71	1
Gonocarpus tetragynus	68	+
Viola hederacea	68	1
Acacia obliquinervia	65	1
Lagenifera stipitata	62	1
Luzula campestris spp. agg.	62	+
Eucalyptus delegatensis	59	2
Veronica derwentia	59	1
Hypochoeris radicata	59	+
Cassinia aculeata	59	1
Arthropodium milleflorum	56	+
Ranunculus plebeius	56	+
Hydrocotyle hirta	56	1
Acacia dealbata	56	1
Olearia erubescens	53	1
Olearia megalophylla	53	1
Geranium potentilloides	53	1
Brachycome aculeata	50	1
Eucalyptus rubida	50	1
Daviesia ulicifolia	47	1
Senecio linearifolius	47	1
Leucopogon gelidus	47	1

NO. OF SITES : 34 (4.7% of total)

DISTRIBUTION : Moderately widespread on the upper, well-watered slopes of the Snowy Range, north of Mt.Tamboritha, eastward to the Mt.Wellington region and scattered between the Aberfeldy and Mt.Baw Baw regions.

ENVIRONMENT : Moist and sheltered subalpine slopes.

ALTITUDE : Mean = 1249m, Highest = 1580m, Lowest = 800m.

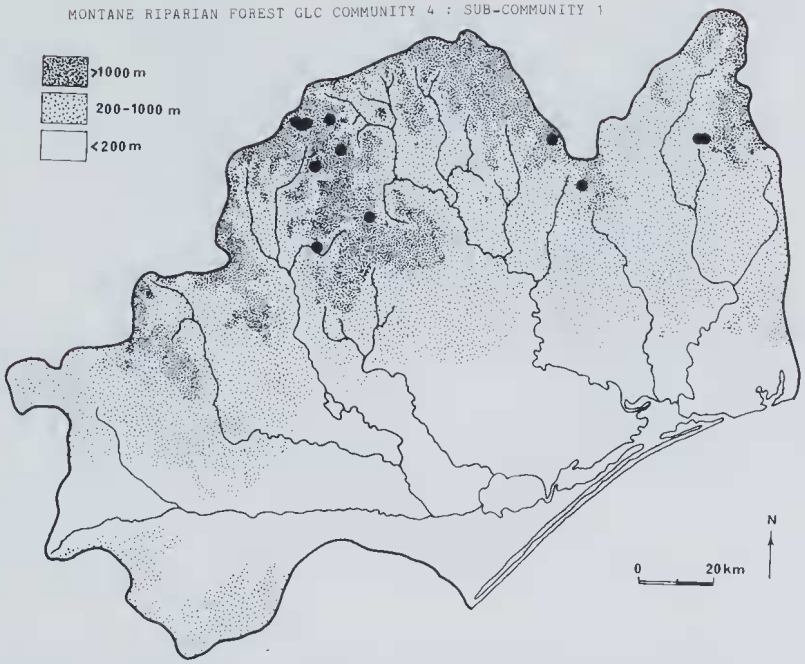
STRUCTURE : Open to Tall open-forest

MEAN FLORISTIC RICHNESS : 42 species per site

MEAN WEED COMPOSITION : 4% of species, 3% of cover

NOTES : This sub-community is floristically very similar to sub-community 3.2. Its distribution in the higher rainfall areas to the west of the study area and its proximity to gullies means that some wetland species (e.g. *Leptospermum grandifolium* and *Carex appressa*) are common and species characteristic of drier country (e.g. *E. dives* and *Platylobium formosum*) are absent. Sub-community 3.3 is more often dominated by *E. delegatensis* than is sub-community 3.2

MONTANE RIPARIAN FOREST GLC COMMUNITY 4 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Polystichum proliferum	100	2
Acaena anserinifolia	91	1
Poa australis spp. agg.	91	1
Blechnum fluviatile	82	1
Eucalyptus delegatensis	82	1
Australina muelleri	82	1
Geranium potentilloides	82	1
Carex appressa	73	1
Leptospermum grandifolium	73	2
Rubus parvifolius	73	1
Acacia dealbata	73	1
Cassinia aculeata	73	1
Dicksonia antarctica	73	2
Senecio linearifolius	73	1
Polyscias sambucifolius	73	+
Urtica incisa	73	1
Cotula filicula	64	+
Hydrocotyle hirta	64	1
Stellaria flaccida	64	1
Tasmannia lanceolata	64	1
Gnaphalium japonicum	64	+
Olearia phlogopappa	64	1
*Hypochoeris radicata	55	+
Lagenifera stipitata	55	+
Coprosma hirtella	55	1
Daviesia latifolia	55	1
Hypolepis rugosula	55	+

NO. OF SITES : 12 (1.6% of total)

DISTRIBUTION : Most common around the Snowy Range but is also scattered near Mts. Birregun and Nugong.

ENVIRONMENT : Deep gullies and watercourses contained within tall, sheltered, montane to subalpine forests.

ALTITUDE : Mean = 1121m, Highest = 1500m, Lowest = 820m.

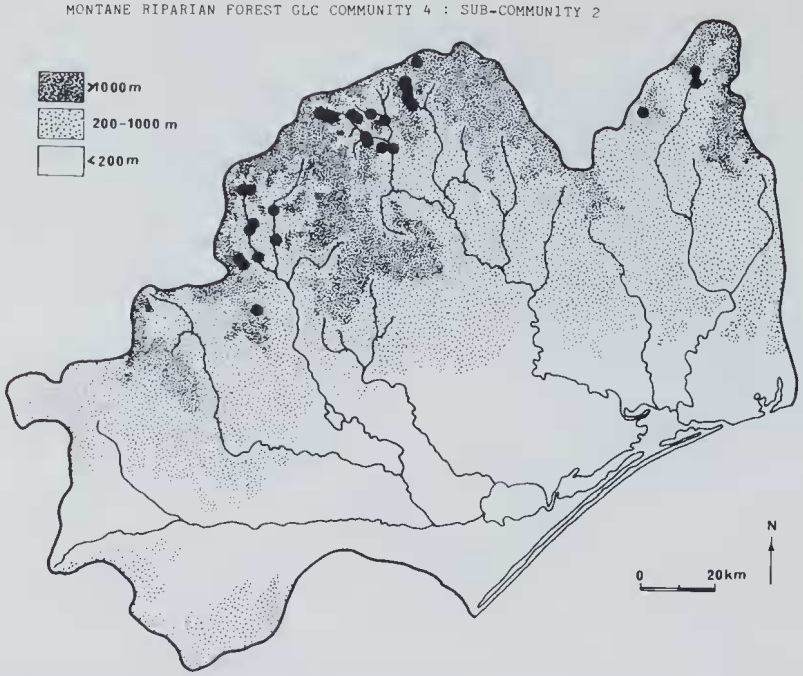
STRUCTURE : Tall open-forest

MEAN FLORISTIC RICHNESS : 42 species per site

MEAN WEED COMPOSITION : 5% of species,3% of cover

NOTES : This sub-community includes the subalpine parallel of the well-known fern gully of lower wet sclerophyll forests. Many species are common to both these vegetation types but species such as *Leptospermum grandifolium* and *Eucalyptus delegatensis* identify sub-community 4.1 as one restricted to higher altitudes.

MONTANE RIPARIAN FOREST GLC COMMUNITY 4 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Rubus parvifolius	93	1
Pteridium esculentum	90	1
Acacia dealbata	90	1
Geranium potentilloides	90	1
Coprosma quadrifida	86	1
Eucalyptus radiata	86	1
Acacia melanoxylon	86	1
Viola hederacea	86	1
Acaena anserinifolia	83	1
Clematis aristata	83	1
Carex appressa	83	1
Cassinia aculeata	76	1
Asperula scoparia	76	1
Poa australis spp. agg.	76	1
Stellaria pungens	76	+
Gnaphalium japonicum	72	+
Blechnum nudum	72	1
Hydrocotyle hirta	72	1
Pomaderris aspera	69	1
Polystichum proliferum	69	1
Prunella vulgaris	66	1
Eucalyptus viminalis	66	1
Cotula filicula	62	+
*Hypochoeris radicata	59	1
Lagenifera stipitata	59	1
Polyscias sambucifolius	59	1
Dichondra repens	52	1
Epilobium cinereum	52	+
Leptospermum grandifolium	52	1
Dianella tasmanica	48	1
Echinopogon ovatus	48	1
Stellaria flaccida	48	+

NO. OF SITES : 29 (4.0% of total)

DISTRIBUTION : Localized within an area including creeksides and headwaters of the Wonnongatta, Wongungarra, Macalister and Humffray Rivers.

ENVIRONMENT : High altitude creeksides, often containing large granite boulders but invariably with a buildup of alluvial soils.

ALTITUDE : Mean = 746m, Highest = 1500m, Lowest = 300m.

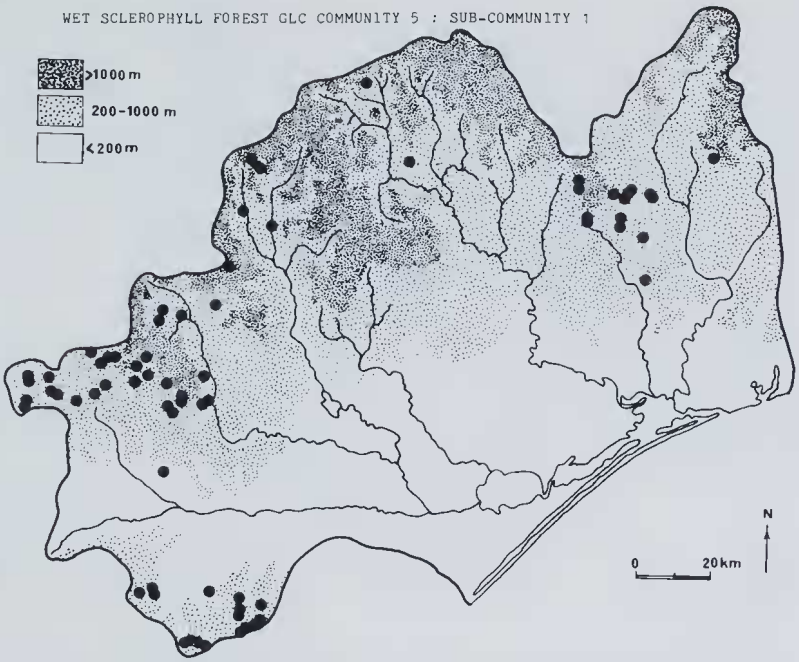
STRUCTURE : Open to Tall open-forest

MEAN FLORISTIC RICHNESS : 52 species per site

MEAN WEED COMPOSITION : 7% of species,6% of cover

NOTES : Structurally, this sub-community is quite typical of both highland and lowland riparian communities. It is characterised by a tall canopy and a dense shrub layer, overlying a ground layer containing a variety of ferns and sedges. Many species of this sub-community are common to river-side sites throughout the State (e.g. *Eucalyptus viminalis, E. radiata, Acacia melanoxylon, Rubus parvifolius, Pomaderris aspera)* but certain species identify this community as being montane (e.g. *Leptospermum grandifolium).*

WET SCLEROPHYLL FOREST GLC COMMUNITY 5 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Polystichum proliferum	85	1
Clematis aristata	83	1
Acacia dealbata	82	1
Hydrocotyle hirta	81	1
Pteridium esculentum	79	1
Viola hederacea	78	1
Acaena anserinifolia	76	1
Dicksonia antarctica	75	1
Cassinia aculeata	75	1
Geranium potentilloides	71	1
Senecio linearifolius	71	1
Coprosma quadrifida	69	1
Alsophila australis	65	1
Tetrarrhena juncea	64	1
Olearia phlogopappa	61	1
Pomaderris aspera	61	1
Eucalyptus regnans	58	2
Prostanthera lasianthos	58	1
Histiopteris incisa	57	+
Australina muelleri	54	1
Olearia lirata	54	1
Olearia argophylla	53	1
Stellaria flaccida	53	1
Polyscias sambucifolius	50	1
*Hypochoeris radicata	49	+
Acacia melanoxylon	46	1
Sambucus gaudichaudiana	44	1
*Rubus fruticosus spp. agg.	44	1
Oxalis corniculata	42	+
Bedfordia arborescens	42	1
Blechnum nudum	40	1
Urtica incisa	38	1
Dianella tasmanica	36	+
Blechnum wattsii	36	1

NO. OF SITES : 73 (10.1% of total)

DISTRIBUTION : A widespread community occurring as far east as the upper Tambo River catchment (Mt.Baldhead/Ensay region), less commonly near the Wongungarra and Macalister Rivers but frequent in the Central Gippsland highlands, Noojee/Mt.Baw Baw area and the Strzlecki Ranges to the South.

ENVIRONMENT : Well watered montane sites to about 1200m altitude.

ALTITUDE : Mean = 645m, Highest = 1300m, Lowest = 130m.

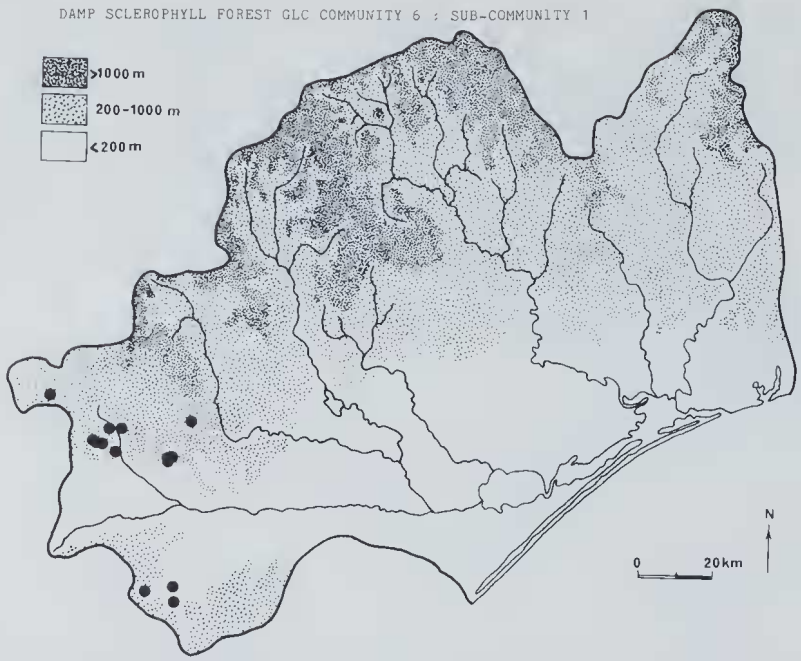
STRUCTURE : Tall open-forest

MEAN FLORISTIC RICHNESS : 37 species per site

MEAN WEED COMPOSITION : 7% of species,5% of cover

NOTES : This selection of sites contains virtually all of the Mountain Ash forests encountered in this study. This species (*Eucalyptus regnans*) is the tallest hardwood tree in the world and is keenly sought for its timber. The "shrub layer", including *Acacia spp.*,of such tall forests frequently attains heights of 30m, and may be virtually unstratified to about 10m. Low light conditions below this level, along with deep leaf litter, usually mean a low species richness for the ground layer.

DAMP SCLEROPHYLL FOREST GLC COMMUNITY 6 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Tetrarrhena juncea	100	2
Gonocarpus tetragynus	93	1
Leptospermum juniperinum	93	1
Pultenaea gunnii	87	1
Acacia mucronata	87	1
Eucalyptus obliqua	87	1
Gahnia radula	80	2
Epacris impressa	80	1
Pteridium esculentum	80	1
Viola hederacea	80	1
Lomandra filiformis	73	1
#Hypochoeris radicata	73	+
Amperea xiphoclada	67	1
Cassinia aculeata	67	+
Eucalyptus radiata	67	1
Lomandra longifolia	67	+
Poa australis spp. agg.	67	1
Goodenia ovata	60	1
Burchardia umbellata	60	1
Drosera auriculata	60	1
Olearia lirata	60	+
Xanthorrhoea minor	60	1
Eucalyptus consideniana	53	2

NO. OF SITES : 15 (2.0% of total)

DISTRIBUTION : Occurring in the south-west of the study area around Neerim South, Tanjil South and Boolarra.

ENVIRONMENT : Dry slopes and gullies

ALTITUDE : Mean = 250m, Highest = 400m, Lowest = 160m.

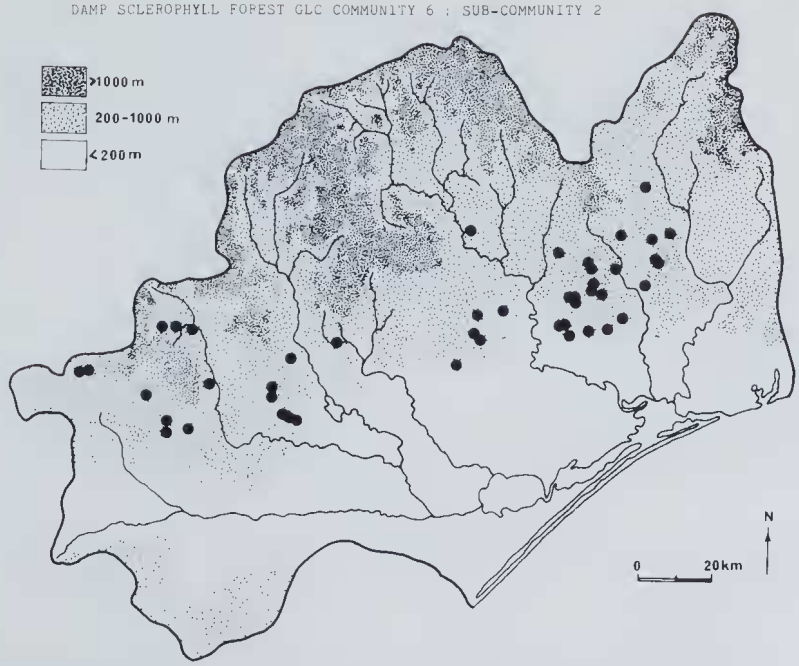
STRUCTURE : Open forest or Woodland

MEAN FLORISTIC RICHNESS : 40 species per site

MEAN WEED COMPOSITION : 3% of species, 1% of cover

NOTES : This sub-community occurs commonly on the lower, more exposed sides of hills which also support sub-community 6.2 and 6.3. It is the lowest altitude sub-community of Community 6. The understorey supports species usually regarded as characteristic of dry areas or heathlands (e.g. *Amperea xiphoclada*, *Epacris impressa*, *Xanthorrhoea minor*) as well as those characteristic of fire regeneration (e.g. *Goodenia* sp., *Cassinia* spp. and *Leptospermum* sp.). This is the only vegetation of the study area in which *E. consideniana* is a character species.

DAMP SCLEROPHYLL FOREST GLC COMMUNITY 6 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Pteridium esculentum	94	1
Viola hederacea	91	1
Acacia dealbata	85	1
Clematis aristata	81	1
Eucalyptus cypellocarpa	74	1
Geranium potentilloides	74	1
Poa australis spp. agg.	74	1
Dianella tasmanica	70	1
Gonocarpus teucrioides	62	1
Eucalyptus obliqua	62	1
Cassinia aculeata	62	1
Lagenifera stipitata	60	+
Lomandra longifolia	58	1
Cassinia longifolia	57	1
*Hypochoeris radicata	57	+
Oxalis corniculata	57	+
Coprosma quadrifida	57	1
Tetrarrhena juncea	55	1
Pomaderris aspera	55	1
Goodenia ovata	51	1
Acaena anserinifolia	51	1
Billardiera scandens	47	+
Epacris impressa	47	1
Alsophila australis	47	1
Hydrocotyle hirta	47	1
Microlaena stipoides	43	1
Senecio quadridentatus	42	+
Olearia lirata	42	1
Culcita dubia	40	1
Gonocarpus tetragynus	40	1
Gnaphalium japonicum	38	+
Senecio linearifolius	38	1
Pimelea axiflora	38	1
Blechnum cartilagineum	36	1
Eucalyptus radiata	36	1
Galium gaudichaudii	36	+

NO. OF SITES : 53 (7.3% of total)

DISTRIBUTION : Occurring over most of the intermediate altitude range of the study area from Noojee to Ensay.

ENVIRONMENT : Wet, foothill slopes usually sheltered from direct northerly exposure.

ALTITUDE : Mean = 436m, Highest = 900m, Lowest = 100m.

STRUCTURE : Open to Tall open-forest

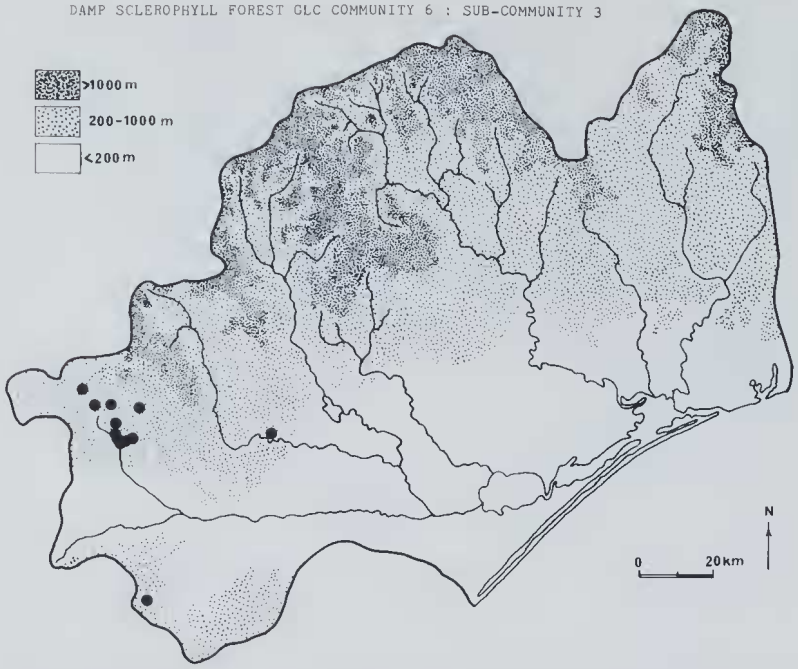
MEAN FLORISTIC RICHNESS : 42 species per site

MEAN WEED COMPOSITION : 3% of species, 2% of cover

NOTES : The frequency of *Pteridium esculentum* indicates significant disturbance (particularly fire induced) to this common vegetation type of the foothills. *E. cypellocarpa* and *E. obliqua*, which dominate the upper stratum, and the understorey of sclerophyllous shrubs, herbs and grasses are all widespread. This sub-community represents a transition between wet and dry sclerophyll vegetation types.

A riparian, wetter variant of this sub-community contains *Prostanthera lasianthos* and *E. viminalis*.

DAMP SCLEROPHYLL FOREST GLC COMMUNITY 6 : SUB-COMMUNITY 3



CHARACTER SPECIES	% FREQ.	C/A
Cassinia aculeata	100	1
Coprosma quadrifida	100	1
Eucalyptus cypellocarpa	100	1
Eucalyptus obliqua	100	1
Gonocarpus teucrioides	100	1
Olearia lirata	100	1
Pteridium esculentum	100	1
Viola hederacea	100	1
Acacia mucronata	92	1
Clematis aristata	92	1
Tetrarrhena juncea	92	2
Alsophila australis	85	1
*Hypochoeris radicata	85	+
Eucalyptus radiata	85	1
Goodenia ovata	85	1
Geranium potentilloides	77	1
Pomaderris aspera	77	1
Pultenaea juniperina	77	1
Acacia verticillata	77	1
Blechnum cartilagineum	77	1
Culcita dubia	77	1
Acacia dealbata	69	1
Hydrocotyle hirta	69	+
Lepidosperma elatius	69	1
Pimelia axiflora	69	1
*Rubus fruticosus spp. agg.	69	+
Oxalis corniculata	62	+
Polyscias sambucifolius	62	1
Platylobium formosum	62	2
Blechnum nudum	62	1
Prunella vulgaris	54	+
Rubus parvifolius	54	1
Gnaphalium japonicum	54	+
Senecio quadridentatus	54	+
Tetratheca ciliata	54	1

NO. OF SITES : 13 (1.8% of total)

DISTRIBUTION : Common forests of the Noojee, Tanjil Bren and Loch Valley areas with a single record to the south in the Strzlecki Ranges.

ENVIRONMENT : Contained within gullies of montane, open-forests but not necessarily adjacent to permanent waterways.

ALTITUDE : Mean = 300m, Highest = 500m, Lowest = 180m.

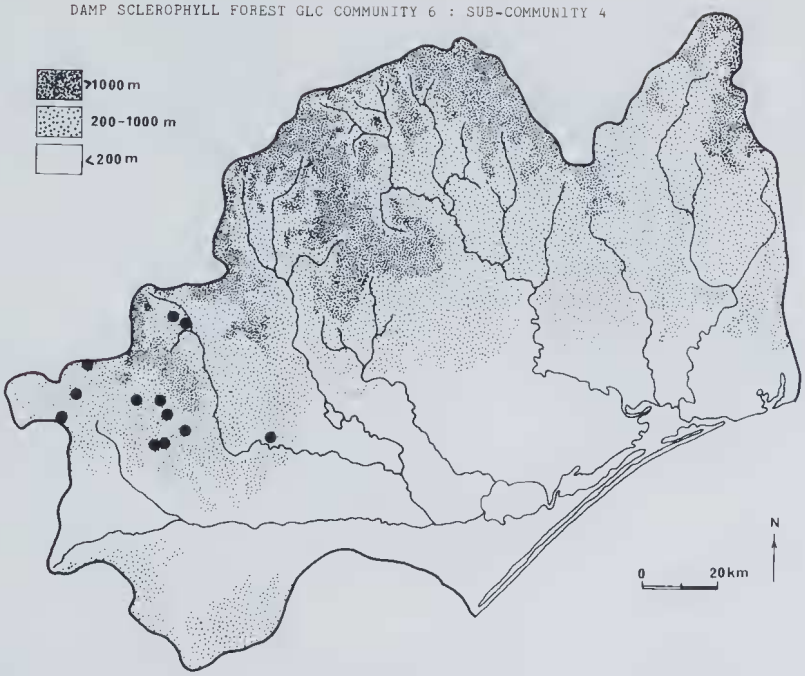
STRUCTURE : Open-forest

MEAN FLORISTIC RICHNESS : 51 species per site

MEAN WEED COMPOSITION : 6% of species,3% of cover

NOTES : A floristically rich sub-community, the canopy consisting of several species (e.g. *E.cypellocarpa, E. obliqua, E. radiata, Acacia dealbata)* and the lower strata containing a diverse assortment of damp forest species (e.g. *Platylobium formosum, Tetratheca ciliata, Acacia mucronata, A. verticillata, Pimelia axiflora).* Disturbance within sub-community 6.3 if low. This is reflected in the fairly high species richness, particularly when compared with sub-community 6.4 (a disturbed, lower diversity subset of this sub-community).

DAMP SCLEROPHYLL FOREST GLC COMMUNITY 6 : SUB-COMMUNITY 4



CHARACTER SPECIES	% FREQ.	C/A
Pteridium esculentum	100	1
Tetrarrhena juncea	100	2
Eucalyptus obliqua	92	1
Viola hederacea	92	+
Eucalyptus cypellocarpa	83	1
Acacia mucronata	75	2
Eucalyptus sieberi	75	2
Goodenia ovata	75	1
Platylobium formosum	75	3
Eucalyptus radiata	67	1
Gonocarpus teucrioides	67	1
Cassinia aculeata	67	1
Tetratheca ciliata	58	1
Pomaderris aspera	58	1
Bedfordia arborescens	58	+
Pultenaea juniperina	58	1

NO. OF SITES : 12 (1.7% of total)

DISTRIBUTION : Scattered distribution between the Noojee and Aberfeldy areas.

ENVIRONMENT : Well-watered slopes of upland areas in and around the Baw Baw ranges. The sites, however, are not those which retain moisture for long periods. Soils are frequently gravelly clays.

ALTITUDE : Mean = 547m, Highest = 950m, Lowest = 200m.

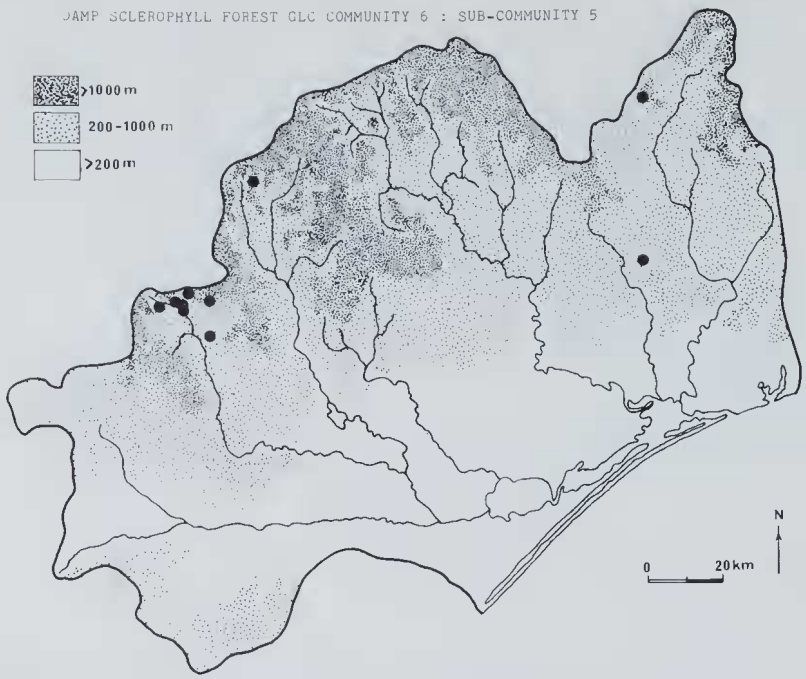
STRUCTURE : Open-forest

MEAN FLORISTIC RICHNESS : 30 species per site

MEAN WEED COMPOSITION : 0% of species, 0% of cover

NOTES : A mixed species forest which is a lower diversity version of sub-community 6.3. Each of the most common eucalypts are of commercial value and are or have been harvested for building timber (the range of this sub-community is contained within a long-active milling and forest management area).

A result of this activity is the high proportion and abundance of species which although native, are indicative of disturbances within the forest (particularly fuel reduction burning). Species such as *Pteridium esculentum, Tetrarrhena juncea, Acacia mucronata, Platylobium formosum, Pultenaea juniperina* and *Eucalyptus sieberi* are becoming increasingly common due to present forest management practices. Another consequence of these activities is the very low floristic richness and almost complete absence of introduced species.



CHARACTER SPECIES	% FREQ.	C/A
Daviesia ulicifolia	100	1
Dianella tasmanica	100	1
Pteridium esculentum	100	1
Acacia dealbata	90	1
Cassinia aculeata	90	1
Eucalyptus radiata	90	1
Gonocarpus tetragynus	90	1
Poa australis spp. agg.	90	2
Senecio quadridentatus	90	+
Stylidium graminifolium	80	1
Viola hederacea	80	1
Lomandra longifolia	80	1
Luzula campestris spp. agg.	80	+
Gnaphalium japonicum	70	+
Eucalyptus cypellocarpa	70	1
Geranium potentilloides	70	+
Stellaria pungens	70	1
Hydrocotyle hirta	60	1
Acacia mucronata	60	2
Coprosma hirtella	60	1
Eucalyptus dives	60	1
*Hypochoeris radicata	60	+
Tetrarrhena juncea	60	1
Acaena anserinifolia	60	1
Deyeuxia rodwayi	60	1
Polystichum proliferum	60	1
Senecio linearifolius	60	1
Polyscias sambucifolius	60	1

NO. OF SITES : 10 (1.4% of total)

DISTRIBUTION : Slopes of the Great Dividing Range in the region of Aberfeldy and Matlock with an isolated occurrence on the Bowen Range near Ensay.

ENVIRONMENT : High-altitude, well-drained hillside.

ALTITUDE : Mean = 875m, Highest = 1120m, Lowest = 650m.

STRUCTURE : Open-forest

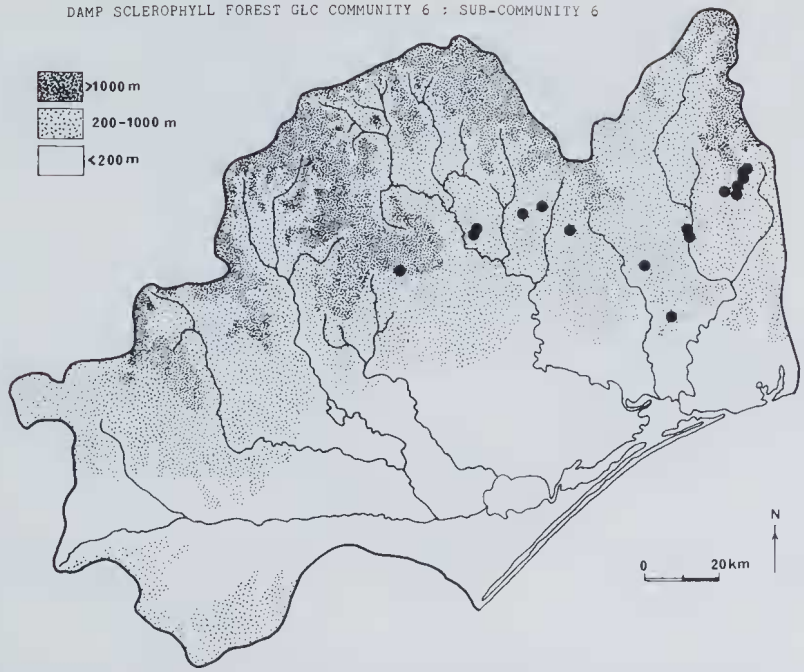
MEAN FLORISTIC RICHNESS : 45 species per site

MEAN WEED COMPOSITION : 3% of species, 2% of cover

NOTES : This sub-community retains a number of species common to the sub-communities 6.3 and 6.4 (e.g. *Eucalyptus cypellocarpa, Polyscias sambucifolia, Polystichum proliferum)* but includes several other species which indicate the well-drained nature of the soils within the region (e.g. *E. dives, Lomandra longifolia, Daviesia ulicifolia).*

The absence of significant quantities of merchantable timber within sub-community 6.5 virtually precludes the incidence of disturbance to the forest as a result of timber harvesting. However, fire appears to have had a modifying influence in promoting certain (native) species to proportions above those expected in an undisturbed forest. (e.g. *Pteridium esculentum, Acacia mucronata, Tetrarrhena juncea).*

DAMP SCLEROPHYLL FOREST GLC COMMUNITY 6 : SUB-COMMUNITY 6



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	83	1
Pteridium esculentum	83	1
Eucalyptus cypellocarpa	78	1
Lomandra longifolia	78	1
Gonocarpus tetragynus	78	1
Hydrocotyle hirta	72	+
Poranthera microphylla	72	+
Galium gaudichaudii	72	+
Hibbertia obtusifolia	72	1
Viola hederacea	72	1
*Hypochoeris radicata	67	+
Senecio quadridentatus	67	+
Eucalyptus globoidea	67	1
Geranium potentilloides	61	+
Acacia dealbata	61	1
Olearia lirata	61	1
Acaena anserinifolia	56	1
Cassinia longifolia	56	1
Clematis aristata	56	+
Eucalyptus obliqua	56	1

NO. OF SITES : 15 (2.0% of total)

DISTRIBUTION : Scattered around Mt. Wellington, Mt. Thomson and Mt. Steve near the upper reaches of the Dargo and Wentworth Rivers, and also east on Mt.Sugarloaf, Mt.Little Dick and south east of Mt. Nugong near Ensay.

ENVIRONMENT : Intermediate altitudes on sheltered slopes, but not extending to gullies.

ALTITUDE : Mean = 664m, Highest = 980m, Lowest = 280m.

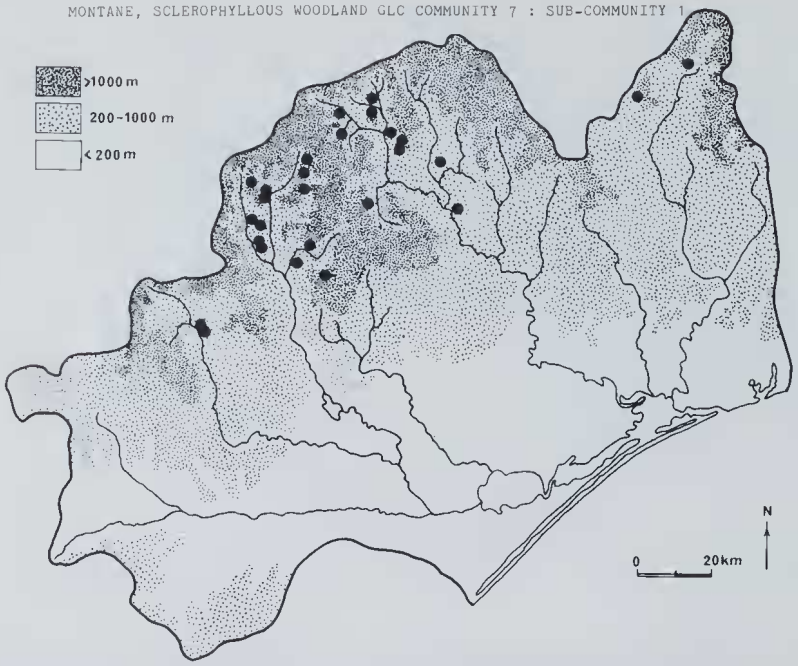
STRUCTURE : Open to Tall open-forest

MEAN FLORISTIC RICHNESS : 38 species per site

MEAN WEED COMPOSITION : 3% of species,2% of cover

NOTES : A rather poorly defined sub-community existing as a congregation of several species which although mainly native are indicative of fire disturbance.

MONTANE, SCLEROPHYLLOUS WOODLAND GLC COMMUNITY 7 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	100	1
Lomandra longifolia	93	1
Eucalyptus dives	93	1
Dianella revoluta	86	1
Hibbertia obtusifolia	86	1
Platylobium formosum	82	1
Gonocarpus tetragynus	82	1
Eucalyptus mannifera	79	1
Exocarpus strictus	75	+
Persoonia confertiflora	75	+
Tetratheca ciliata	71	1
Pimelia linifolia	68	1
Acacia dealbata	64	+
Monotoca scoparia	61	1
Stylidium graminifolium	61	1
Hardenbergia violacea	57	1
Cassinia aculeata	54	1
Acrotriche serrulata	50	1
Viola hederacea	50	+
Pteridium esculentum	50	1
Daviesia virgata	50	1
Dillwynia retorta	46	1

NO. OF SITES : 28 (3.9% of total)

DISTRIBUTION : Never distant from the backbone of the Great Dividing Range and concentrated within the watersheds of the Macalister and Wonnangatta Rivers, with a few isolated occurrences near Mt.Lookout, Aberfeldy and the Bowen Range.

ENVIRONMENT : Dry, rather exposed upland slopes, typically with a northerly aspect and and frequently steep. Water retention in the poorly structured, often shaly soils is low.

ALTITUDE : Mean = 761m, Highest = 1200m, Lowest = 420m.

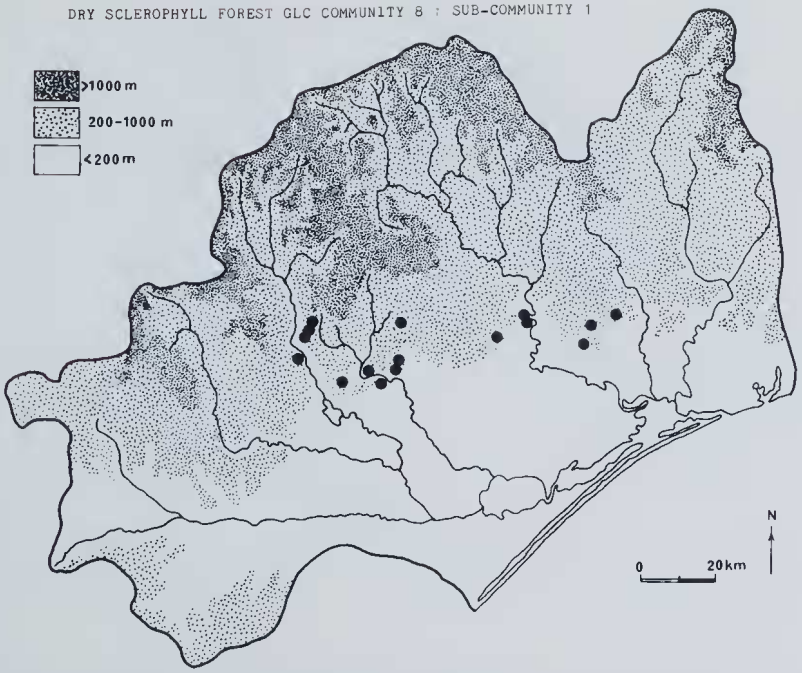
STRUCTURE : Woodland

MEAN FLORSITIC RICHNESS : 37 species per site

MEAN WEED COMPOSITION : 2% of species, 1% of cover

NOTES : A high proportion of dry slope species (e.g. *Eucalyptus dives, E. macrorhyncha, E. mannifera, Persoonia confertiflora, Hardenbergia violacea* etc.) appear in this community and similarly few plants of the wetter montane forests intrude. This sub-community has attracted little disturbance through either fire control measures or logging due to its open, sparse nature and lack of sawlog species.

DRY SCLEROPHYLL FOREST GLC COMMUNITY 8 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Hydrocotyle hirta	94	1
Poa australis spp. agg.	94	1
Dichondra repens	82	1
Eucalyptus polyanthemos	82	1
Oxalis corniculata	82	+
Cassinia longifolia	76	2
Geranium potentilloides	76	1
Glycine clandestina	76	1
Hypericum gramineum	76	+
*Hypochoeris radicata	76	1
Lagenifera stipitata	71	1
Microlaena stipoides	71	1
Acacia mearnsii	65	1
Cheilanthes tenuifolia	65	1
Hibbertia obtusifolia	65	1
Senecio quadridentatus	65	1
Galium gaudichaudii	65	+
Luzula campestris spp. agg.	65	+
Gnaphalium japonicum	59	+
Billardiera scandens	59	+
Cymbonotus preissianus	59	1
Lepidosperma laterale	59	+
Stypandra glauca	59	1
Veronica plebeia	53	+
Leptospermum phylicoides	53	2
Lomandra longifolia	53	1
Phyllanthus hirtellus	53	+

NO. OF SITES : 17 (2.3% of total)

DISTRIBUTION : Mostly on slopes in the upper reaches of the Avon, Macalister, Mitchell and Nicholson River catchments.

ENVIRONMENT : Dry hills, often of northerly and north-easterly aspect.

ALTITUDE : Mean = 257m, Highest = 500m, Lowest = 70m.

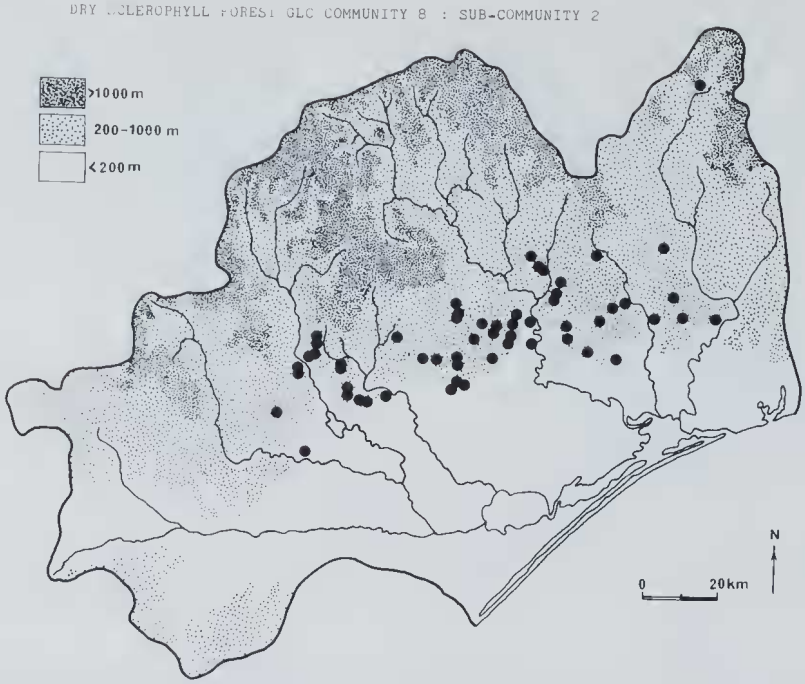
STRUCTURE : Open-forest to Woodland

MEAN FLORISTIC RICHNESS : 52 species per site

MEAN WEED COMPOSITION : 6% of species, 5% of cover

NOTES : The abundance of species such as *Cassinia longifolia, Hypericum gramineum, Hypochoeris radicata, Senecio quadridentatus* and *Luzula campestris* strongly suggest a history of fire and grazing for this type of vegetation. Nevertheless a large percentage of this floristically-rich vegetation maintains most of its original flora.

DRY SCLEROPHYLL FOREST GLC COMMUNITY 8 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Cassinia longifolia	86	1
Lomandra longifolia	83	1
Poa australis spp. agg.	80	1
Hibbertia obtusifolia	68	1
Stypandra glauca	64	1
Eucalyptus polyanthemos	61	1
Lagenifera stipitata	59	1
*Hypochoeris radicata	59	1
Hypericum gramineum	54	+
Hydrocotyle hirta	54	1
Dianella revoluta	53	1
Acacia dealbata	51	1
Eucalyptus macrorhyncha	51	1
Lepidosperma laterale	47	1
Acacia falciformis	46	1
Gonocarpus tetragynus	44	1
Hardenbergia violacea	44	+
Acacia terminalis	44	1
Eucalyptus sieberi	42	1
Phyllanthus hirtellus	41	1
Viola hederacea	41	1
Microlaena stipoides	41	1
Epacris impressa	39	1
Eucalyptus globoidea	39	1
Galium gaudichaudii	39	+
Senecio quadridentatus	37	+
Persoonia confertiflora	37	+
Eucalyptus cypellocarpa	37	1
Cassinia aculeata	36	+

NO. OF SITES : 59 (8% of total)

DISTRIBUTION : Throughout the central and eastern foothills of the study area.

ENVIRONMENT : Dry hills, often of northerly and north-easterly aspect.

ALTITUDE : Mean = 352m, Highest = 660m, Lowest = 80m.

STRUCTURE : Open-forest to Woodland

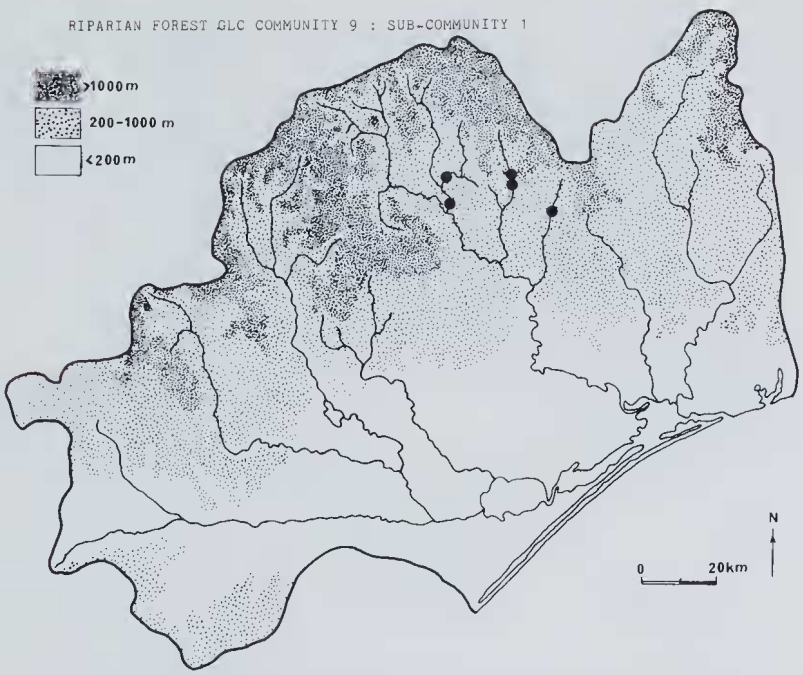
MEAN FLORISTIC RICHNESS : 35 species per site

MEAN WEED COMPOSITION : 2% of species, 2% of cover

NOTES : Sub-communities 8.1 and 8.2 are floristically very similar however the understorey of the latter is characterized by a lower abundance of herbs, (e.g *Dichondra repens, Oxalis corniculata, Geranium potentilloides* are absent) and a higher abundance of small sclerophyllous shrubs (e.g. *Epacris impressa, Phyllanthus hirtellus, Hardenbergia violacea*).

There is also a suggestion of disturbance effects reflected in the low floristic richness of this sub-community when compared to sub-community 8.1.

RIPARIAN FOREST GLC COMMUNITY 9 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Hymenanthera dentata	100	1
*Rubus fruticosus spp. agg.	100	1
Eucalyptus melliodora	83	1
Acacia dealbata	83	1
Acaena anserinifolia	83	1
Dichondra repens	83	1
Oxalis corniculata	83	1
*Rosa rubiginosa	83	1
Prunella vulgaris	67	1
Eucalyptus bridgesiana	67	1
Acacia mearnsii	67	1
Acacia melanoxylon	67	1
*Anagallis arvensis	67	+
*Cirsium vulgare	67	1
Eucalyptus viminalis	67	1
Geranium potentilloides	67	1
*Hypochoeris radicata	67	1
Leptospermum phylicoides	67	2
Pteridium esculentum	67	2

NO. OF SITES : 6 (8% of total)

DISTRIBUTION : Occurring on the Dargo, Wentworth and Crooked Rivers in the north of the study area.

ENVIRONMENT : Riparian vegetation of the higher part of this altitude range.

ALTITUDE : Mean = 343m, Highest = 540m, Lowest = 220m.

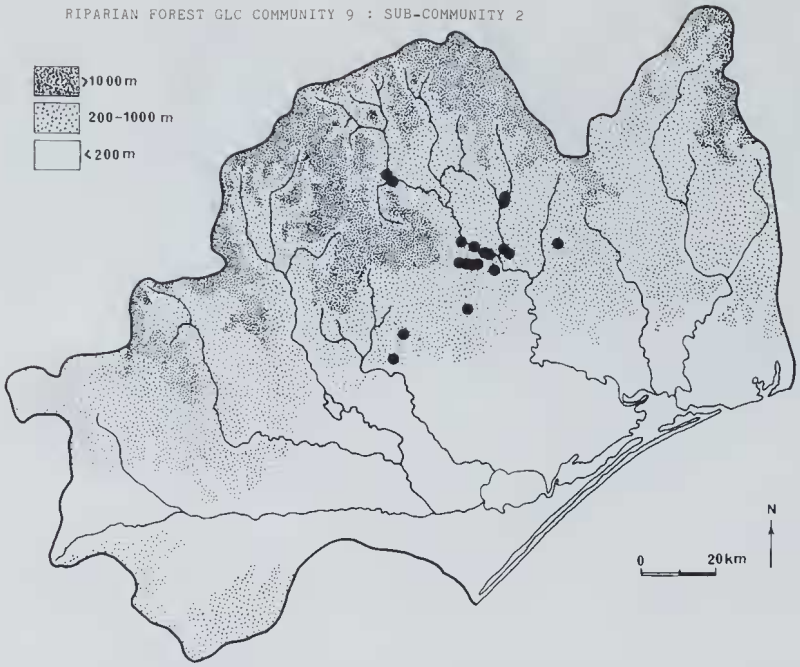
STRUCTURE : Open-forest

MEAN FLORISTIC RICHNESS : 44 species per site

MEAN WEED COMPOSITION : 22% of species, 22% of cover.

NOTES : This riparian vegetation occurs amongst otherwise dry hillsides of the Dargo region. Agriculture and mining have led to a high degree of disturbance with a number of introduced species such as *Rubus fruticosus* and *Rosa rubiginosa* being significant.

RIPARIAN FOREST GLC COMMUNITY 9 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Poa australis spp. agg.	95	1
*Hypochoeris radicata	95	1
Rumex brownii	95	+
Echinopogon ovatus	90	1
Oxalis corniculata	90	+
*Anagallis arvensis	85	+
Dichondra repens	85	+
Glycine clandestina	85	+
Pteridium esculentum	80	1
Gnaphalium japonicum	80	+
*Conyza bonariensis	75	+
*Cirsium vulgare	75	+
Leptospermum phylicoides	75	2
Eucalyptus melliodora	75	1
Dichelachne micrantha	70	+
*Sonchus asper	70	+
Acaena anserinifolia	70	1
Cassinia longifolia	70	1
Cheilanthes tenuifolia	70	+
Hydrocotyle laxiflora	70	1
*Centaurium pulchellum	70	+
Microlaena stipoides	70	+
Luzula campestris spp. agg.	65	+
*Sonchus oleraceus	65	+
Acacia mearnsii	65	1
Agropyron scabrum	65	1
Urtica incisa	65	1
Carex appressa	60	1
Prunella vulgaris	60	1
*Hypericum perforatum	60	1
*Cerastium glomeratum	60	+
*Rubus fruticosus spp. agg.	60	1
Danthonia racemosa	60	1
Galium gaudichaudi	60	+
Hypericum gramineum	60	+
Plantago debilis	60	+
Eucalyptus bridgesiana	55	1
*Rosa rubiginosa	55	+
Poranthera microphylla	55	+
Hymenanthera dentata	55	1
Acacia dealbata	55	1
Clematis aristata	55	+
Hydrocotyle hirta	55	1
Rubus parvifolius	55	+
*Aira caryophyllea	50	+
Dichelachne crinita	50	+
Geranium retrorsum	50	1
Stellaria pungens	50	1
*Trifolium repens	50	+
*Trifolium campestre	50	1
Acacia melanoxylon	50	1
Bursaria spinosa	50	1
Daucus glochidiatus	50	+
Lagenifera stipitata	50	+
*Vulpia bromoides	50	+

NO. OF SITES : 20 (2.8% of total)

DISTRIBUTION : Widespread in the central part of the study area centering on Dargo.

ENVIRONMENT : Riparian vegetation surrounded by dry hillsides.

ALTITUDE : Mean = 335m, Highest = 600m, Lowest = 180m.

STRUCTURE : Open-forest

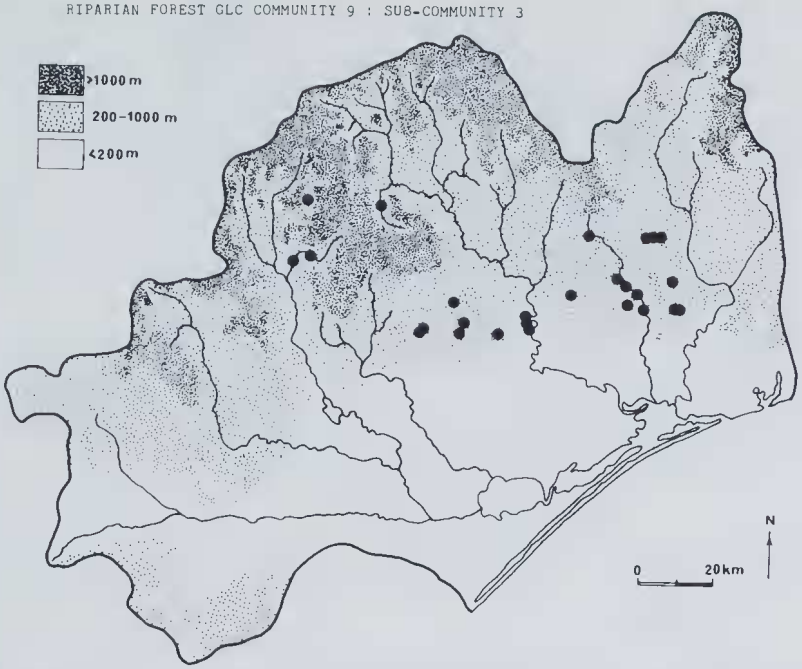
MEAN FLORISTIC RICHNESS : 75 species per site

MEAN WEED COMPOSITION : 21% of species, 20% of cover.

NOTES : This sub-community represents a seriously disturbed riparian vegetation, characterised by a large number of native and introduced weedy species. Most of these are herbs and reflect agricultural practice in the district. Many of the farms in the area are now derelict and most of sub-community 9.2 is on land of this type.

Sub-community 9.2 is floristically the richest vegetation of the study area. Although a significant proportion of its constituent species are introduced it still has the highest mean number of native species per site (60) of all vegetation types.

RIPARIAN FOREST GLC COMMUNITY 9 : SUB-COMMUNITY 3



CHARACTER SPECIES	% FREQ.	C/A
Pomaderris aspera	93	1
Dichondra repens	93	1
Poa australis spp. agg.	86	1
Geranium potentilloides	86	1
Pteridium esculentum	79	1
Adiantum aethiopicum	79	1
*Hypochoeris radicata	79	1
Viola hederacea	75	1
Acaena anserinifolia	75	1
Hydrocotyle hirta	75	1
Oxalis corniculata	75	+
Acacia dealbata	71	1
Lomandra longifolia	71	1
Clematis aristata	68	+
Cassinia aculeata	68	1
Leptospermum phylicoides	68	2
Cassinia longifolia	64	1
Coprosma quadrifida	64	1
Eucalyptus bridgesiana	64	1
*Rubus fruticosus spp. agg.	61	+
Acacia melanoxylon	61	1
Gnaphalium japonicum	61	+
Eucalyptus viminalis	61	1
Galium gaudichaudii	57	+
Stellaria flaccida	57	1
Blechnum nudum	54	1
Prostanthera lasianthos	54	1
Prunella vulgaris	54	1
Lagenifera stipitata	54	1
Stellaria pungens	54	1
*Centaurium pulchellum	50	+
Lepidosperma laterale	50	1
Carex appressa	46	1
Luzula campestris spp. agg.	46	+
Pimelea axiflora	46	+

NO. OF SITES : 29 (4% of total)

DISTRIBUTION : Widespread east of Glenaladale, also in the Mt.Tamboritha area.

ENVIRONMENT : Riparian vegetation

ALTITUDE : Mean = 283m, Highest = 680m, Lowest = 100m.

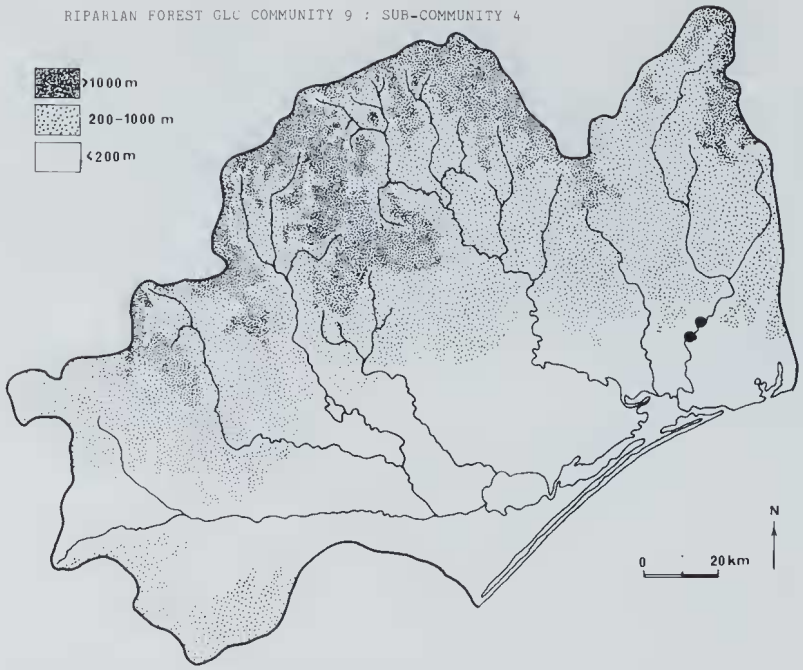
STRUCTURE : Open-forest

MEAN FLORISTIC RICHNESS : 51 species per site

MEAN WEED COMPOSITION : 7% of species,5% of cover

NOTES : Sub-communities 9.2 and 9.3 share a large number of species most of which are native. The major difference between these sub-communities is the large complement of introduced species in 9.2. Sub-community 9.2 therefore represents a disturbed (possibly re-established) form of 9.3 which has lost none of its native species. There are a number of other potential sites for this vegetation which are utilized for agriculture and possess only remnants of the original flora.

RIPARIAN FOREST GLC COMMUNITY 9 : SUB-COMMUNITY 4



CHARACTER SPECIES	% FREQ.	C/A
Acacia floribunda	100	1
*Cerastium glomeratum	100	1
*Cirsium vulgare	100	+
*Conyza bonariensis	100	1
*Dactylis glomerata	100	1
*Galium aparine	100	+
Geranium potentilloides	100	1
*Hypochoeris radicata	100	1
Leptospermum phylicoides	100	1
Phragmites australis	100	1
*Plantago lanceolata	100	1
Poa australis spp. agg.	100	2
Pteridium esculentum	100	1
Rubus parvifolius	100	1
*Acetosella vulgaris	100	1
*Rumex crispus	100	1
Veronica plebeia	100	+
*Vicia angustifolia	100	+
*Rubus fruticosus spp. agg.	100	1

NO. OF SITES : 2 (0.27% of total)

DISTRIBUTION : Both examples of this community were sampled on the banks of the Tambo River near Bruthen.

ENVIRONMENT : Close proximity to an intensive agricultural region and a large waterway.

ALTITUDE : Mean = 90m, Highest = 160m, Lowest = 20m.

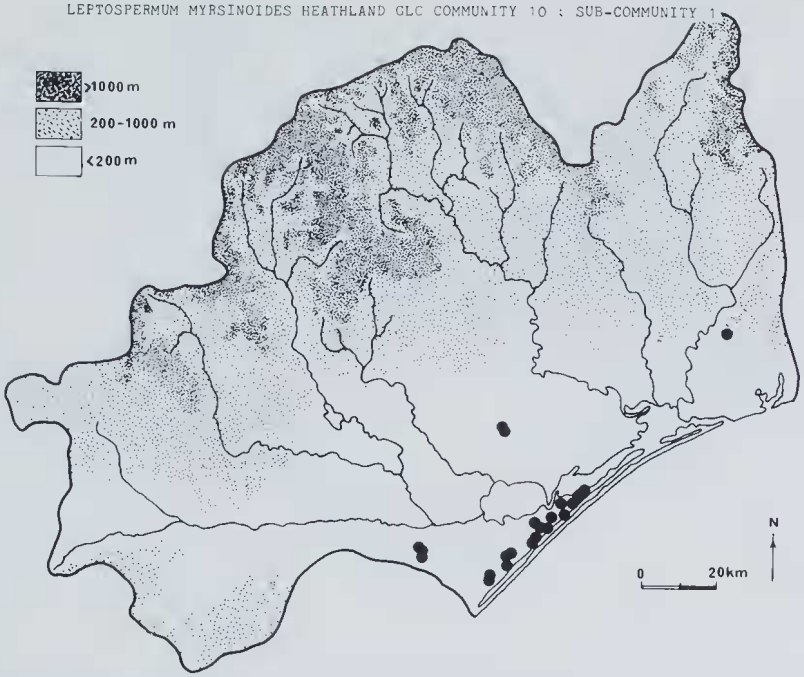
STRUCTURE : Low shrubland

MEAN FLORISTIC RICHNESS : 42 species per site

MEAN WEED COMPOSITION : 39% of species, 36% of cover.

NOTES : The sites on which this sub-community is found are highly disturbed by agriculture. It is probable that they once supported sub-community 9.3 vegetation.

LEPTOSPERMUM MYRSINOIDES HEATHLAND GLC COMMUNITY 10 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Epacris impressa	100	1
Bossiaea cinerea	92	1
Banksia marginata	92	1
Lomandra longifolia	92	1
Monotoca scoparia	92	1
Leptospermum myrsinoides	88	2
Leucopogon ericoides	88	1
Acacia oxycedrus	88	1
Leucopogon virgatus	88	1
Banksia serrata	83	1
Pteridium esculentum	79	1
Caustis pentandra	75	1
Eucalyptus nitida	75	1
Leptospermum juniperinum	71	1
Hibbertia fasciculata	67	1
Hibbertia virgata	63	1
Amperea xiphoclada	58	+
*Hypochoeris radicata	58	+
Lepidosperma concavum	54	1
Brachyloma daphnoides	50	1
Dampiera stricta	50	1
Dillwynia glaberrima	50	1
Drosera peltata	50	+
Lomandra filiformis	50	1

NO. OF SITES : 25 (3.5% of total)

DISTRIBUTION : Mainly south and west from Sperm Whale Head on podzols developed from siliceous sands.

ENVIRONMENT : Flat or undulating areas beyond the influence of sea winds, on deep siliceous sands.

ALTITUDE : Mean = 23m, Highest = 160m, Lowest = 0m.

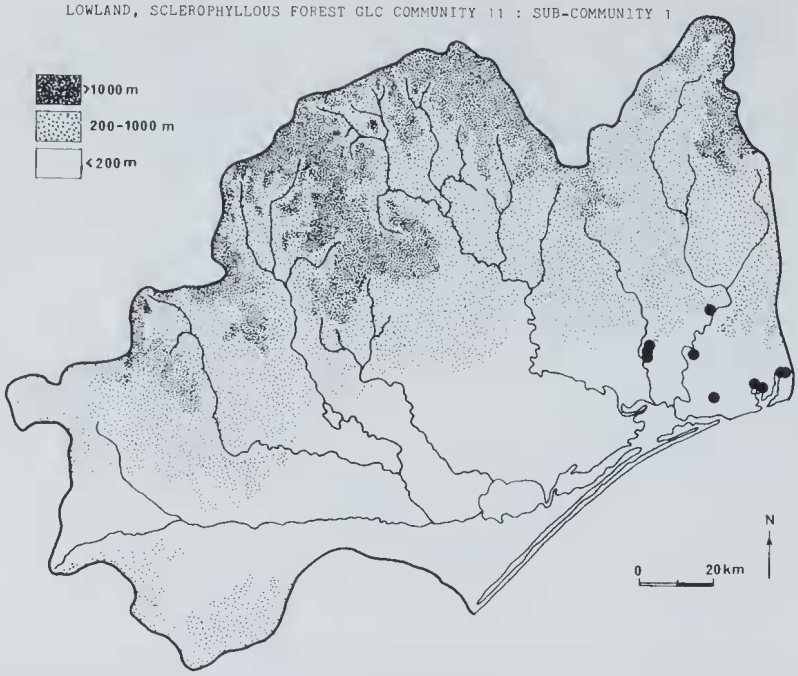
STRUCTURE : Low open-woodland to closed heath.

MEAN FLORISTIC RICHNESS : 38 species per site

MEAN WEED COMPOSITION : 4% of species, 2% of cover

NOTES : This is a representative of a distinctive floristic community dominated by the small-leafed, sclerophyllous shrub *Leptospermum myrsinoides*. Most of the species in sub-community 10.1 are common in heathland vegetation throughout the State.

LOWLAND, SCLEROPHYLLOUS FOREST GLC COMMUNITY 11 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Viola hederacea	100	1
Billardiera scandens	90	+
Lagenifera stipitata	90	1
Microlaena stipoides	90	1
Pteridium esculentum	90	2
Cassinia longifolia	80	1
Clematis aristata	80	1
Eucalyptus globoidea	80	2
Hibbertia obtusifolia	70	+
Poa australis spp. agg.	70	1
Acianthus exsertus	70	+
Eucalyptus cypellocarpa	70	1
Galium gaudichaudii	70	+
Hydrocotyle hirta	70	1
Luzula campestris spp. agg.	70	+
Olearia lirata	70	1
Goodenia ovata	60	1
Hibbertia aspera	60	1
*Hypochoeris radicata	60	1
Lomandra longifolia	60	1
Opercularia hispida	60	+
Senecio quadridentatus	60	+
Veronica plebeia	60	1

NO. OF SITES : 18 (2.5% of total)

DISTRIBUTION : Confined in the study area to the foothills within the Bruthen, Nowa Nowa and Lake Tyers region.

ENVIRONMENT : Dry conditions on the undulating land system which includes the tributaries of Lake Tyers. Soils are often deep sands but occasionally also include clays and gravelly soils.

ALTITUDE : Mean = 78m, Highest = 140m, Lowest = 20m.

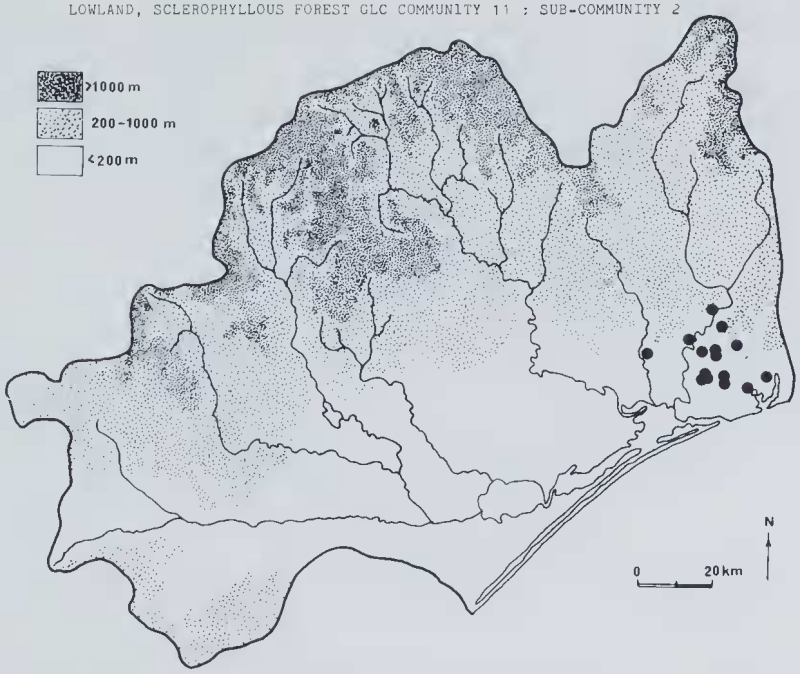
STRUCTURE : Open-forest

MEAN FLORISTIC RICHNESS : 46 species per site

MEAN WEED COMPOSITION : 3% of species, 2% of cover

NOTES : This restricted vegetation is intermediate in composition between the more coastal heaths and the open-forests of the foothills. Throughout most of its range sub-community 11.1 shows strong signs of disturbance by fire. Most understorey plants are small and young and *Pteridium esculentum* is the dominant understorey species in most sites.

LOWLAND, SCLEROPHYLLOUS FOREST GLC COMMUNITY 11 : SUB-COMMUNITY 2



CHARACTER SPECIES	% FREQ.	C/A
Epacris impressa	94	1
Gonocarpus teucrioides	94	1
Lomandra longifolia	94	1
Pteridium esculentum	94	2
Acrotriche serrulata	89	1
Persoonia linearis	89	+
Craspedia glauca	89	1
Tetratheca pilosa	83	1
Eucalyptus globoidea	83	2
Lagenifera stipitata	83	1
Xanthorrhoea minor	78	1
*Hypochoeris radicata	78	1
Eucalyptus sieberi	78	1
Hydrocotyle hirta	78	1
Phyllanthus hirtellus	72	1
Viola hederacea	72	1
Lomatia ilicifolia	72	+
Stypandra glauca	67	1
Hibbertia obtusifolia	67	1
Eucalyptus cypellocarpa	61	1
Acacia genistifolia	61	1
Senecio quadridentatus	61	+
Billardiera scandens	61	+
Poa australis spp. agg.	61	1
Hypericum gramineum	56	+
Microlaena stipoides	56	1

NO. OF SITES : 10 (1.4% of total)

DISTRIBUTION : The range of this community is effectively the same as that of 11.1 but is generally in closer proximity to water, such as Lake Tyers and the Nicholson River.

ENVIRONMENT : Dry conditions on the undulating land system which includes sub-community 11.1

ALTITUDE : Mean = 127m, Highest = 270m, Lowest = 50m

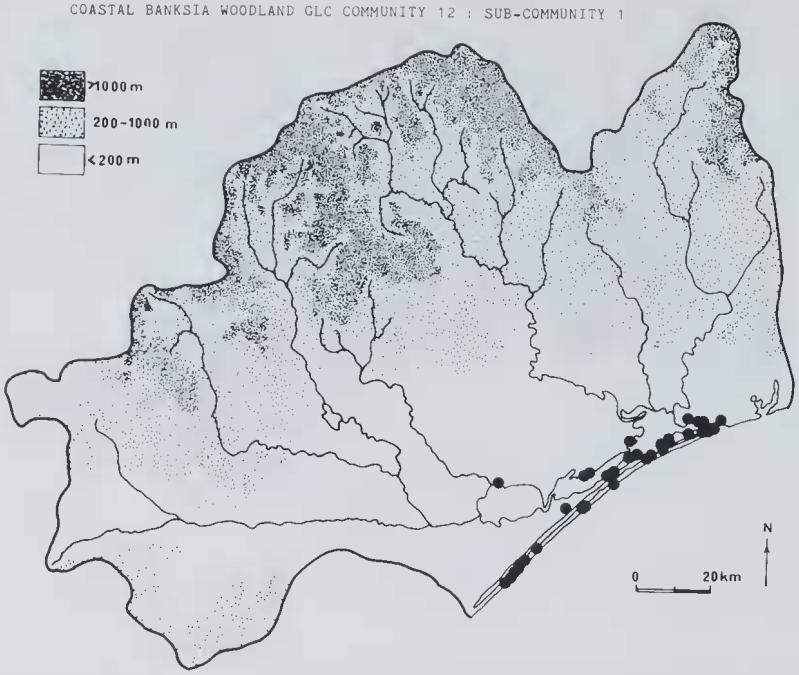
STRUCTURE : Open-forest

MEAN FLORISTIC RICHNESS : 47 species per site

MEAN WEED COMPOSITION : 2% of species, 1% of cover

NOTES : This sub-community is basically a more disturbed and species-poor version of sub-community 11.1. It contains few species not found in sub-community 11.1 and lacks *Eucalyptus sieberi* as well as a number of ground cover species.

COASTAL BANKSIA WOODLAND GLC COMMUNITY 12 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
Scirpus nodosus	88	1
Dichondra repens	86	1
*Hypochoeris radicata	86	1
Lomandra longifolia	83	1
Pteridium esculentum	76	2
Hydrocotyle hirta	69	1
Geranium potentilloides	67	1
Lagenifera stipitata	64	1
Oxalis corniculata	64	+
*Cerastium glomeratum	64	+
Crassula sieberiana	64	+
Banksia integrifolia	62	1
Ranunculus sessiliflorus	60	1
Tetragonia implexicoma	60	1
Melaleuca ericifolia	55	2
Microlaena stipoides	52	1
Cotula australis	52	1
Poa australis spp. agg.	52	1
Glycine clandestina	50	+
Rhagodia baccata	50	1
Lepidosperma concavum	50	1
Luzula campestris spp. agg.	50	+
Baumea juncea	45	1
Gonocarpus teucrioides	45	+
*Cirsium vulgare	43	+
Senecio spp.	43	1
Scirpus antarcticus	43	+
Acacia longifolia	40	1
Samolus repens	40	1
*Conyza bonariensis	40	+
Distichlis distichophylla	40	1
*Sonchus oleraceus	40	+

NO. OF SITES : 43 (6% of total)

DISTRIBUTION : Virtually all sites sampled were along the leeward side of the 90 Mile Beach dunes.

ENVIRONMENT : Protected secondary dunes inland from community 13. Soils are virtually pure calcareous sand with a minimal topsoil development.

ALTITUDE : Mean = 0m, Highest = 20m, Lowest = 0m.

STRUCTURE : Low open-woodland

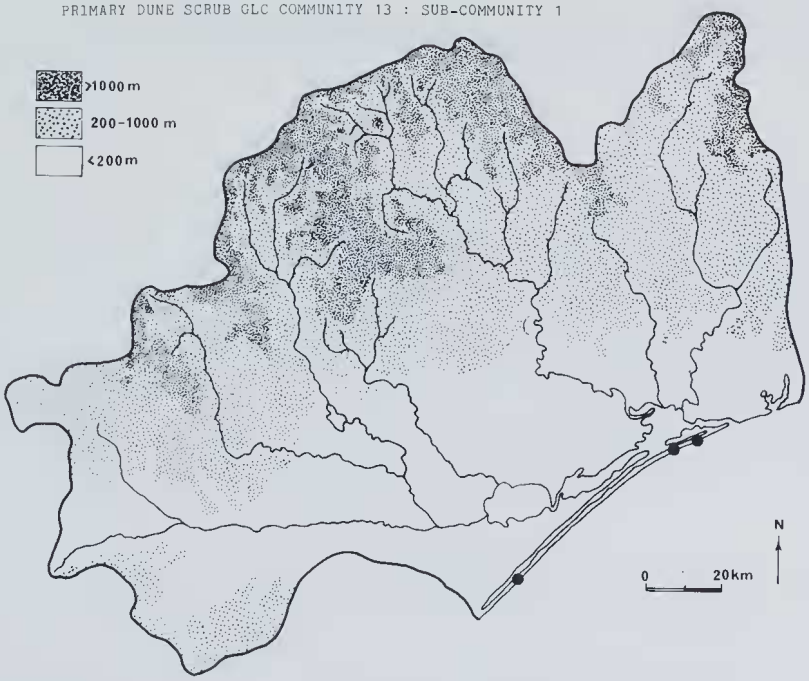
MEAN FLORISTIC RICHNESS : 44 species per site

MEAN WEED COMPOSITION : 14% of species, 10% of cover.

NOTES : This sub-community consists primarily of sclerophyllous plants growing on nutrient-poor calcareous sands. However, a small number of species which are found almost exclusively in the two or three metres immediately adjacent to the lake (e.g. *Samolus repens, Distichlis distichophylla*) are usually representative of a true salt marsh community (see Bridgewater,1975). This latter vegetation is poorly developed around the Gippsland Lakes and its components are therefore included in Community 12.

The past history of grazing on vegetation appears to have affected its floristic composition. Many introduced species have invaded sub-community 12.1 and make up (on average) 14% of its flora.

PRIMARY DUNE SCRUB GLC COMMUNITY 13 : SUB-COMMUNITY 1



CHARACTER SPECIES	% FREQ.	C/A
*Ammophila arenaria	100	3
Apium prostratum	100	+
Leucopogon parviflorus	100	+
Rhagodia baccata	100	1
Scirpus nodosus	100	1
Calocephalus brownii	67	1
Galium gaudichaudii	67	+
Spinifex hirsutus	67	1
Tetragonia implexicoma	67	1
Acacia longifolia	67	1
Clematis microphylla	67	1
Crassula sieberiana	67	+
Dichondra repens	67	1
*Hypochoeris radicata	67	+
Leptospermum laevigatum	67	2
Olearia axillaris	67	1
Oxalis corniculata	67	1
Pelargonium australe	67	1
Actites megalocarpus	67	1
*Sonchus oleraceus	67	+

NO. OF SITES : 3 (0.42% of total)

DISTRIBUTION : Distributed along the length of the 90 Mile Beach between Seaspray and Lakes Entrance.

ENVIRONMENT : Frontal dunes frequently exposed to strong, salt-laden winds.

ALTITUDE : Mean = 0m, Highest = 0m, Lowest = 0m.

STRUCTURE : Shrubland

MEAN FLORISTIC RICHNESS : 24 species per site

MEAN WEED COMPOSITION : 17% of species, 21% of cover.

NOTES : With the exception of the introduced Marram Grass *(Ammophila arenaria)*, frequently planted as a sand-binder, this well-defined community is dominated by native species. The lack of disturbance to this community is probably a function of its inaccessibility (e.g. the almost entirely unroaded dune region of the 90 Mile Beach) which in turn demonstrates the fecundity and dispersal ability of *A. arenaria*. This grass and the native *Spinifex hirsuta* (the frequency of which seems to have decreased since the introduction of *A. arenaria* might be regarded among the most important species of the coastal areas. Their sand-binding ability stabilizes the dunes which afford protection from oceanic winds.